This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

B 427166

TRANSACTIONS

—OF—

The National Association of Cotton Manufacturers.

SUCCESSOR TO

New England Cotton Manufacturers' Association,

ORGANIZED AS THE HAMPDEN COUNTY SPINNERS' ASSOCIATION.

Founded 1854. Incorporated Dec. 1, 1894.

NO. 82.

ANNUAL MEETING.

Held in Huntington Hall, Massachusetts Institute of Technology, 491 Boylston Street, Boston, Mass.

APRIL 24 and 25, 1907.

Office of the Association:

Room 57, International Trust Building, 45 Milk Street, Corner of Devonshire St., Boston, Mass.

1907.

Digitized by Google

THE GIFT OF

Association

Digitized by Google

The National Association of Cotton Manufacturers.

Proposal for

Membership of

Application Received

190

Action by Board of Government, *favorable.*

NOTICE TO MEMBERS.

To make The National Association of Cotton Manufacturers the representative body which its name implies and to broaden the organization as far as possible, it must include more of those who are eligible for membership.

It has been found that many who were eligible and desired to join had not done so because not invited. It is hoped that every member will present the matter to eligible non-members among his associates. The accompanying blank proposition for membership can be detached from the cover at the row of perforations.

Digitized by Google

1837
ARTES VERITAS SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN

Digitized by Google

The National Association of Cotton Manufacturers.

Proposal for

Membership of

Application Received

190 .

Action by Board of Government, *favorable.*

190 .

Voted by the Association, *elected.*

190 .

Digitized by Google

The National Association of Cotton Manufacturers,

SUCCESSOR TO

New England Cotton Manufacturers' Association,

Room 57, International Trust Building,

45 MILK STREET,

BOSTON, MASS.

PROPOSAL FOR MEMBERSHIP.

(When filled out, to be mailed at any time to the Secretary, P. O. Box 3672, Boston, Mass., for action by the Board of Government, at least one week before a meeting of the Association.)

Mr. .....
State first name as well as surname.

Position, ...

Business Connection, ...
Name of corporation or firm.

P. O. Address, ...
Number. Street.

.....
City or town. State.

is proposed for .....
active or associate

membership in THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS *by* .....
signature of member proposing candidate.

a member of the Association.

The undersigned certifies that the above statements are correct, and agrees that, if elected to the Association, he will be governed by its rules as long as his connection with it shall continue.

Date, ... 190 .

signature of candidate.

REMARKS: It is desired that the proposer will supply such additional information as will aid in determining the eligibility of the applicant.

Digitized by Google

Digitized by Google

Digitized by Google

TS
1550
.N2

Digitized by Google

Wm. D. Hartshorne

Digitized by Google

TRANSACTIONS

—OF—

The National Association of Cotton Manufacturers.

SUCCESSOR TO

New England Cotton Manufacturers' Association,

ORGANIZED AS THE HAMPDEN COUNTY SPINNERS' ASSOCIATION.

Founded 1854. **Incorporated Dec. 1, 1894.**

NO. 82.

ANNUAL MEETING.

Held in Huntington Hall, Massachusetts Institute of Technology, 491 Boylston Street, Boston, Mass.

APRIL 24 and 25, 1907.

Office of the Association:

Room 57, International Trust Building, 45 Milk Street, Corner of Devonshire St., Boston, Mass.

1907.

Digitized by Google

ENTERED ACCORDING TO ACT OF CONGRESS
IN THE YEAR 1907
BY THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS
IN THE OFFICE OF THE LIBRARIAN OF CONGRESS
AT WASHINGTON.

By vote of the Board of Government, the price of the *Transactions* is $5.00 per copy to non-members. The price of this issue and the one previous is $1.00 each to members, and the prices of copies previous to Volume 61, is 50 cents to members, but each member is entitled to a copy as a part of the privilege of membership.

Digitized by Google

197082

Digitized by Google

Digitized by Google

CHARTER.

No. 6091.

Commonwealth of Massachusetts.

BE IT KNOWN, That whereas, EDWARD W. THOMAS, C. J. H. WOODBURY, WILLIAM J. KENT, F. M. MESSENGER, HARRY T. WHITIN, ARTHUR H. LOWE, ALBERT F. KNIGHT, ALFRED M. GOODALE, FRED C. MCDUFFIE and GEORGE W. BEAN have associated themselves with the intention of forming a corporation under the name of the NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION, for the purpose of encouraging scientific investigation and experiment as to the methods of manufacturing cotton; collecting and imparting information relating to this industry, promoting social intercourse among its members; and establishing and maintaining a library of works on textiles in the city of Boston, and have complied with the provisions of the Statutes of this Commonwealth in such case made and provided, as appears from the certificate of the President, Treasurer and Directors of said corporation, duly approved by the Commissioner of Corporations, and recorded in this office.

Now, Therefore, I, WILLIAM M. OLIN, Secretary of the Commonwealth of Massachusetts, do hereby certify that said EDWARD W. THOMAS, C. J. H. WOODBURY, WILLIAM J. KENT, F. M. MESSENGER, HARRY T. WHITIN, ARTHUR H. LOWE, ALBERT F. KNIGHT, ALFRED M. GOODALE, FRED C. MCDUFFIE and GEORGE W. BEAN, their associates and successors, are legally organized and established as and are hereby made an existing corporation under the name of the

NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION,

with the powers, rights and privileges, and subject to the limitations, duties and restrictions which by law appertain thereto.

Seal of the Commonwealth of Massachusetts.

Witness my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed this first day of December, in the year of our Lord one thousand eight hundred and ninety-four.

WILLIAM M. OLIN,

Secretary of the Commonwealth.

Digitized by Google

Commonwealth of Massachusetts.

(Acts of 1895, Chap. 163.)

AN ACT TO AUTHORIZE THE NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION TO HOLD ITS MEETINGS WITHOUT THE COMMONWEALTH.

Be it enacted, etc., as follows:

SECTION 1. The New England Cotton Manufacturers' Association is hereby authorized to hold its meetings in any state or territory of the United States and in the District of Columbia; provided, however, that its annual meeting shall be held in this Commonwealth at least once in five years.

SECT. 2. This act shall take effect upon its passage. [Approved March 23, 1895.]

No. 252.

Commonwealth of Massachusetts.

BE IT KNOWN that whereas

NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION,

a corporation organized under the laws of this Commonwealth and subject to the provisions of chapter one hundred and twenty-five of the Revised Laws has complied with the provisions of chapter one hundred and nine of the Revised Laws, as appears from the certified copy of the order of the Commissioner of Corporations, authorizing said corporation to change its name and adopt the name of

THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS,

and the certificate of the Vice-President and Acting President, Treasurer and Directors of said corporation duly filed in this office pursuant to the provisions of section ten of the aforesaid chapter one hundred and nine of the Revised Laws.

NOW THEREFORE, I, William M. Olin, Secretary of the Commonwealth of Massachusetts, DO HEREBY CERTIFY, that the name which said corporation shall bear is

THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS,

which shall hereafter be its legal name.

Seal of the Commonwealth of Massachusetts.

WITNESS my official signature hereunto subscribed, and the Great Seal of the Commonwealth of Massachusetts hereunto affixed this twenty-fifth day of June in the year of our Lord one thousand nine hundred and six.

WM. M. OLIN,
Secretary of the Commonwealth.

Digitized by Google

THE

NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

SUCCESSOR TO

NEW ENGLAND COTTON MANUFACTURERS' ASSOCIATION.

FOUNDED 1854.

INCORPORATED DECEMBER 1, 1894.

CONSTITUTION AND BY-LAWS.

ACTIVE MEMBERS.

ARTICLE 1. Any person who is actively engaged as President, Treasurer, Agent, Superintendent or Manager in the manufacture, printing or finishing of cottons shall be eligible for active membership.

ELECTION OF MEMBERS.

ARTICLE 2. All nominations for membership shall be made in writing, at least one week before the date of any regular meeting, and shall be considered by the Board of Government, and reported to the meeting, favorably or adversely, for the action of the Association. *Provided*, that in case the Board shall decide to report adversely upon any nomination, the member who shall have made it shall be informed of the intention so to report, in order that he may have an opportunity to withdraw the name. Upon such report active members may be admitted, if they obtain a majority of votes of the members present and voting therefor, by acceptance in writing, and paying an admission fee of ten dollars, and maintaining their membership by the payment of an annual assessment not exceeding ten dollars.* Any member failing to pay two successive assessments shall cease to be a member at the end of six months from the date when such second assessment shall become due. Any member may withdraw from the Association upon payment of all arrearages, first giving notice of his intention so to do, in writing, to the Secretary, and the Board of Government may

* This assessment has never exceeded five dollars for active members and ten dollars for associate members.

Digitized by Google

accept such resignation; and any member may be expelled for cause, at any regular meeting, two-thirds of the members present voting therefor.

ASSOCIATE MEMBERS.

ARTICLE 3. Persons engaged in the manufacture of cotton or cotton fabrics, or the manufacture of textile machinery, or industries kindred to the cotton manufacture, may become associate members of the Association. The methods of application, nomination, election and withdrawal from the Association being under the same conditions as those provided for active members in Article 2 excepting that this class of membership does not carry with it the privilege of voting or speaking, except by permission from the Board of Government or a vote of the Association to allow permission.

The initiation fee for associate members shall be twenty-five dollars, and the annual assessment shall be double the sum annually voted for active members.

Associate members may be expelled by a majority vote of the Board of Government.

HONORARY MEMBERS.

ARTICLE 4. Honorary members may be elected, when recommended by the Board of Government, at any regular meeting of the Association, who shall be enrolled as such, and shall be entitled to attend the meetings of the Association and participate in its proceedings, without the right to vote. They shall not be subject to payment of admission fees or assessments. No person actively engaged in cotton manufacture shall be eligible to honorary membership.

LIFE MEMBERS.

ARTICLE 5. Any active or associate member by the single payment of one hundred dollars shall be exempt from all future payments for dues and shall become a life member having all the privileges of active members.

All moneys thus paid shall be invested as a permanent fund by the Treasurer acting under the direction of the Board of Government, of which the income only shall be subject to appropriation for current expenses.

Digitized by Google

ARTICLE 6. It shall be the duty of all members of the Association to make returns to the Secretary of such statistics as may be called for by him, under the direction of any committee duly appointed for the collection of statistics, when not incompatible with private interests.

OFFICERS.

ARTICLE 7. The officers of this Association shall be a President, two Vice-Presidents, nine Directors, a Treasurer, Secretary, and Auditor of Accounts.

ELECTION OF OFFICERS.

ARTICLE 8. At each annual meeting there shall be chosen by ballot a President, two Vice-Presidents and three Directors; the President and Vice-Presidents to serve one year, and the three Directors shall be chosen for terms of three years, unless sooner removed as hereinafter provided.

DUTIES OF OFFICERS.

ARTICLE 9. The President, or in his absence the senior Vice-President present, shall preside at all meetings of the Association and of the Board of Government. All officers shall hold their respective offices until their successors shall be chosen and accept their positions.

ARTICLE 10. The President, Vice-Presidents and Directors shall constitute a Board of Government, and have under their care and direction all matters pertaining to the management of the Association; and five of their number shall constitute a quorum for the transaction of business. Meetings of the board may be called by the President, at such time and place as he may deem expedient, giving each member a written or printed notice of the same at least five days before the day of meeting. At their first meeting the board shall elect a Treasurer, Secretary, and Auditor of Accounts for the year ensuing, and fix the amount of compensation of the Secretary. All vacancies in their board occasioned by death or resignation or removal, shall be filled by the board; and the persons so elected shall hold their offices until the next annual meeting except as hereinafter provided. The board may, from time to time, as they shall deem expedient, appoint committees, from among their own board or from the members at large, to collect statistical information, examine new inventions or processes in manufacturing goods, as also to prepare essays on subjects of interest to the Association.

Digitized by Google

ARTICLE 11. The Treasurer shall keep a book in which all receipts and payments of money shall be entered, collect all moneys due the Association, and disburse the same upon the written order of the Board of Government. At the annual meeting in each year he shall make an exhibit of his accounts, or oftener if the Board of Government require it. He shall notify the members of assessments voted, and cause them to be collected in a reasonable time.

ARTICLE 12. The Secretary shall attend all meetings of the Association and of the Board of Government, and keep accurate records of their doings. In the absence of the Secretary at any meeting, a Secretary *pro tem.* may be appointed by the presiding officer, who shall be sworn to do all things, while in office, required of the Secretary.

ARTICLE 13. The Auditor shall examine the accounts of the Treasurer annually, and report at each meeting the state of the finances.

ARTICLE 14. Any officer who shall unreasonably absent himself from three consecutive meetings of the Board of Government of which he is a member, or shall otherwise neglect or refuse to perform the duties of his office, may be removed from office at any regular meeting of the Board of Government by a vote of a majority of the members present and voting thereon, a notice of such proposed action to be sent to him by mail at least one week previous to the meeting.

MEETINGS.

ARTICLE 15. The annual meeting of the members of the Association shall be held on the last Wednesday of April, or at such other time, and at such hour and place as the Board of Government may appoint. There shall also be a semi-annual meeting of the Association on the last Wednesday of October, in each and every year, or at such other time, and at such place and hour as the Board of Government may appoint.

Special meetings may be called by the Board of Government whenever they deem it expedient, or upon the written application of any ten members, made to the Secretary.

ARTICLE 16. All meetings of the members of the Association shall be in pursuance of a written or printed notice, addressed to each member, with the name of the President or Secretary attached thereto, and deposited in the Post Office ten days at least before the day of meeting, specifying the time and place of meeting; and at all such meet-

Digitized by Google

ings fifteen members shall constitute a quorum for the transaction of business.

ARTICLE 17. Amendments to the By-Laws may be made at any stated meeting of the Association by a two-thirds vote; *provided*, notice of such proposed amendment be given in writing at a previous meeting, and also notice be given to each member by the Secretary, of the pendency of such amendment, ten days at least before any such meeting.

AMENDMENT TO CONSTITUTION AND BY-LAWS.

The following amendment was adopted at the seventy-fifth meeting of the Association, September 30, 1903:

"ARTICLE 5. Any active or associate member by the single payment of one hundred dollars shall be exempt from all future payments for dues and shall become a life member having all the privileges of active members.

All moneys thus paid shall be invested as a permanent fund by the Treasurer acting under the direction of the Board of Government, of which the income only shall be subject to appropriation for current expenses.

All articles of the Constitution and By-Laws, beginning with Article 5, shall be increased in number to the next cardinal number."

Digitized by Google

BOARD OF GOVERNMENT.

1907.

PRESIDENT.

WILLIAM D. HARTSHORNE, . . LAWRENCE, MASS.

VICE-PRESIDENTS.

CHARLES T. PLUNKETT, . . . ADAMS, MASS.
GEORGE OTIS DRAPER, . . . HOPEDALE, MASS.

DIRECTORS.

ROBERT BEATTY, ... PHILADELPHIA, PA.
FREDERICK A. FLATHER, . . LOWELL, MASS.
GEORGE P. GRANT, JR., . . . FITCHBURG, MASS.
EDWIN FARNHAM GREENE, . . BOSTON, MASS.
FRANKLIN W. HOBBS, . . . BOSTON, MASS.
JOHN W. KNOWLES, ... NEW BEDFORD, MASS.
WILLIAM H. LOFTUS, ... NEWARK, N. J.
HENRY F. MANSFIELD, . . . UTICA, N. Y.
ROSCOE S. MILLIKEN, . . . NASHUA, N. H.

AUDITOR.

C. E. ROBERTS, ... BOSTON, MASS.

SECRETARY AND TREASURER.

C. J. H. WOODBURY, P. O. BOX 3672, BOSTON, MASS.

OFFICE OF THE ASSOCIATION:

ROOM 501, INTERNATIONAL TRUST BUILDING, 45 MILK STREET, CORNER OF DEVONSHIRE STREET, BOSTON, MASS.

Digitized by Google

OFFICERS OF THE ASSOCIATION,

FROM THE FIRST ORGANIZATION.

PRESIDENTS.

Ezekiel A. Straw,	1865–78	A. M. Goodale,	1895–96
Amos D. Lockwood,	1878–80	Arthur H. Lowe,	1896–97
John Kilburn,	1880–83	Russell W. Eaton,	1897–98
William C. Lovering,	1883–85	Stephen A. Knight,	1898–99
Richard Garsed,	1885–86	Frederick E. Clarke,	1899–99
J. S. Ludlam,	1886–88	D. M. Thompson,	1900–01
Henry F. Lippitt,	1888–89	Charles H. Fish,	1901–03
Walter E. Parker,	1889–92	H. E. Walmsley,	1903–05
Robert McArthur,	1892–94	James R. MacColl	1905–07
Edw. W. Thomas,	1894–95	William D. Hartshorne,	1907–

VICE-PRESIDENTS.

Amos D. Lockwood,	1865–77	E. W. Thomas,	1892–94
William A. Burke,	1865–73	A. M. Goodale,	1893–95
John C. Palfrey,	1873–76	William J. Kent,	1894–97
Edward Atkinson,	1876–78	Fred. C. McDuffie,	1895–00
A. G. Cumnock,	1877–80	Henry T. Whitin,	1897–00
Charles Nourse,	1878–81	C. H. Richardson,	1900–01
William F. Goulding,	1880–83	George H. Hills,	1900–02
Richard Garsed,	1881–85	H. E. Walmsley,	1901–03
J. S. Ludlam,	1883–86	Alfred E. Adams,	1902–03
Walter E. Parker,	1885–89	James R. MacColl,	1903–05
Richard B. Borden,	1886–88	W. D. Hartshorne,	1903–07
Arnold B. Sanford,	1888–91	George A. Ayer,	1905–07
Robert McArthur,	1889–92	George Otis Draper,	1907–
Simeon B. Chase,	1891–93	Charles T. Plunkett,	1907–

Digitized by Google

DIRECTORS.

J. S. Davis,	1865–69
Charles Nourse,	1865–78
Phineas Adams,	1865–74
William P. Haines,	1865–69
Thomas J. Borden,	1865–78
Daniel D. Crombie,	1865–68
A. M. Wade,	1868–69
D. J. Johnston,	1869–70
F. E. Clarke,	1869–75
A. G. Cumnock,	1869–77
Cyrus I. Barker,	1875–80
Hervey Kent,	1877–81
David J. Johnston,	1878–82
Walter Paine, 3d,	1878–80
Chas. L. Lovering,	1878–83
Richard Garsed,	1880–81
William H. Jennings,	1880–83
Chas. D. McDuffie,	1881–83
Walter E. Parker,	1881–85
John W. Danielson,	1881–85
William E. Barrows,	1882–83
Rufus A. Maxfield,	1883–86
George W. Weeks,	1883–86
Henry S. Howe,	1883–87
Richard B. Borden,	1883–86
O. S. Brown,	1885–91
Henry F. Lippitt,	1885–88
Wilbur A. Stiles,	1886–88
Robert McArthur,	1886–89
Stephen N. Bourne,	1886–91
John Kilburn,	1870–80
William P. Haines,	1874–78
S. S. Spencer,	1887–90
E. W. Thomas,	1888–92
William W. Whitin,	1888–93
Robert R. Smith,	1889–92
Alfred M. Goodale,	1890–93
William J. Kent,	1891–94
Herman F. Straw,	1891–93
Fred C. McDuffie,	1892–95
George W. Bean,	1892–95
F. M. Messenger,	1893–95
Albert F. Knight,	1893–99
Arthur H. Lowe,	1894–96
Henry T. Whitin,	1894–97
Herbert L. Pratt,	1895–98
Stephen A. Knight,	1895–98
John Eccles,	1895–99
Russell W. Eaton,	1896–97
C. H. Richardson,	1897–00
George H. Hills,	1897–00
John T. Meats,	1898–01
Alfred E. Adams,	1899–02
A. Tenny White,	1899–02
Charles H. Fish,	1900–01
Herbert E. Walmsley,	1900–01
Wm. D. Hartshorne,	1901–03
James R. MacColl,	1901–03
Geo. F. Whitten,	1898–04
W. B. Smith Whaley,	1901–04
J. R. Montgomery,	1902–05
Wm. D. Pennell,	1902–05
George A. Ayer,	1904–05
P. A. Mathewson,	1903–06
Christopher P. Brooks,	1904–07
Charles T. Plunkett,	1905–07

Digitized by Google

DIRECTORS.—Continued

George Otis Draper,	1906–07	Robert Beatty,	1906–
George P. Grant, Jr.,	1903–07	Henry F. Mansfield,	1906–
William H. Loftus,	1905–	Frederick A. Flather,	1907–
Roscoe S. Milliken,	1905–	Edwin Farnum Greene,	1907–
Franklin W. Hobbs,	1906–	John W. Knowles,	1907–

AUDITORS.

Benjamin Saunders,	1865–71	J. Herbert Sawyer,	1882–00
John C. Palfrey,	1871–73	C. E. Roberts,	1900–
Henry D. Sullivan,	1873–82		

SECRETARY AND TREASURER.

Ambrose Eastman,	1865–94	C. J. H. Woodbury,	1894–

Digitized by Google

Digitized by Google

MEMBERS OF THE ASSOCIATION.

May 1, 1907.

Members of the Association are respectfully requested to scrutinize the following list, and advise the Secretary, P. O. Box 3672, Boston, Mass., of change in address, or any error in regard to their names.

As a number of members rejoined the Association after severing their first membership, the date of their earliest election is given.

HONORARY MEMBERS.

George Arms	Grand Hotel	New York City	Oct. 16, 1872.
Henry Smith Pritchett, LL.D.,	Prest. Mass. Institute of Technology,	Boston, Mass.	Sept. 26, 1901.
Edward C. Stokes		Trenton, N. J.,	Sept. 21, 1905.
Franklin P. Stoy	817 Pacific Ave.,	Atlantic City,	Sept. 21, 1905.
Samuel Webber	Hydraulic Engineer	Charlestown, N. H.	Apr. 20, 1865.

LIFE MEMBERS.*

John Ormsbee Ames	Agt. & Sec'y Fletcher Mfg. Co.,		Sept. 21, 1905.
	47 Charles St.,	Providence, R. I.,	Sept. 21, 1905.
William Ames	Treas. Fletcher Mfg. Co., P. O. Box 83,		Apr. 30, 1879.
	47 Charles St.,	Providence, R. I.,	Sept. 21, 1905.
Augustus T. Clark	Treas. American Circular Loom Co.	Chelsea, Mass.	Sept. 21, 1905.
			Sept. 21, 1905.
Daniel J. Danker	Danker & Marston, 247 Atlantic Ave.,	Boston, Mass.	Apr. 28, 1904.
			Apr. 25, 1907.
Charles H. Fish	Agt. Cocheco Manufg. Co.,	Dover, N. H.,	Apr. 27, 1887.
			Apr. 28, 1904.
William D. Hartshorne	Agt. Arlington Mills,	Lawrence, Mass,	Apr. 27, 1899.
			Apr. 26, 1906.

* The first date is that of the original election to the Association and the second date that of Life Membership.

Digitized by Google

James R. MacColl	Treas. Lorraine Mfg. Co.	Pawtucket, R. I.,	Apr. 24, 1895. Sept. 21, 1905.
John P. Marston	Danker & Marston, 247 Atlantic Ave.,	Boston, Mass.	Apr. 28, 1904. Apr. 25, 1907.
John R. Mitchell	Prest. Mitchell-Bissell Co. 227 Fulton St.,	New York City	Oct. 18, 1900. Apr. 27, 1905.
Robert W. Neff	Chemical Mfr., 22 India Sq.,	Boston, Mass.,	Apr. 24, 1902. Apr. 28, 1904.
Walter E. Parker	Agt. Pacific Mills 217 Haverhill St.,	Lawrence, Mass.	Apr. 25, 1877. Apr. 27, 1905.
George I. Rockwood	Mech. Eng. 62 Summer St.,	Worcester, Mass.	Apr. 25, 1901. Apr. 25, 1901.
Robert Schaellibaum	Prest. Robert Schaellibaum Co.	Providence, R. I.	Sept. 22, 1904. Sept. 22, 1904.
C. J. H. Woodbury	Secretary and Treasurer, 51 Baltimore St.,	Lynn, Mass.,	Oct. 29, 1879. Apr. 28, 1904.

ACTIVE MEMBERS.

James H. Abercrombie	Mech. Supt., Clark Thread Co.	Newark, N. J.	Apr. 25, 1907.
Alfred E. Adams	Agt. Whitinsville Cotton Mills Agt. Linwood Mills	Whitinsville, Mass.	Apr. 27, 1887.
Ivers S. Adams	Supt. American Net and Twine Co.	East Cambridge, Mass.	Sept. 22, 1904.
Robert Franklin Adams,	Treas. The Adams Mfg. Co. 106 Grand St.,	New York, N. Y.	Sept. 22, 1904.
William P. Adams	Supt. Pittsfield Mills,	Pittsfield, N. H.,	Apr. 28, 1904.
James W. Ahmuty	Supt. Atlantic Cotton Mills,	Lawrence, Mass.,	Apr. 28, 1904.
Joseph D. Aiken	Asst. Supt. Ponemah Mills	Taftville, Conn.	Oct. 28, 1891.
F. S. Akin	Supt. Cornell Mills	Fall River, Mass.	Sept. 27, 1894.
Charles T. Aldrich	Treas. Aldrich Mfg. Co. 37 Weybosset St., Box 34,	Providence, R. I.	Apr. 28, 1886.
Bradley C. Algeo	Asst. Director Philadelphia Textile School, Broad and Pine Sts.,	Philadelphia, Pa.,	Sept. 21, 1905.
G. Bion Allen	Sec'y Pawtucket Branch J. & P. Coats, Ltd. 117 Mulberry St.,	Pawtucket, R. I.	Apr. 25, 1907.
John W. Allis	Vice-Prest. and Agt. Utica Knitting Co.,	Utica, N. Y.	Apr. 27, 1905.
George E. Ames	Mech. Supt. Lawrence Mfg. Co.	Lowell, Mass.	Apr. 24, 1895.
Charles B. Amory	Treas. Hamilton Manufg. Co. 70 Kilby St.,	Boston, Mass.	Apr. 25, 1894.
Frederic Amory	Treas. Nashua Mfg. Co. and Jackson Mfg. Co. 85 Devonshire St., P. O. Box 1302,	Boston, Mass.	Apr. 27, 1899.
Joshua D. Armitage	Supt. Cloth Dept., Arlington Mills 247 Haverhill St.,	Lawrence, Mass.	Apr. 26, 1906.

Digitized by Google

Thomas Armstrong . . Supt. No. Pownal Mfg. Co. . . . . No. Pownal, Vt. . . Oct. 28, 1897.
William F. Arthur . . Supt. Nashua Mfg. Co. . . . . Nashua, N. H. . . . Apr. 23, 1903.
Abel T. Atherton . . . Machine Maker . . . . . Longmeadow, R. I. . Oct. 16, 1872.
E. W. Atkinson . . . . Stoddard, Haserick, Richards & Co. . . . . 152 Congress St., Boston, Mass. . . . Oct. 27, 1886.
H. C. Atwood . . . . Treas. Williamsville Manufg. Co. . . Killingly, Conn. . . Apr. 29, 1885.
James A. Atwood . . . Agt. Wauregan Co. and Quinebaug Co. . . . . Wauregan, Conn. . . Oct. 28, 1891.
John Walter Atwood . Supt. Wauregan Co. . . . . Wauregan, Conn. . . Oct. 25, 1895.
W. E. Atwood . . . . Prest. Williamsville Manufg. Co. . . Killingly, Conn. . . . Sept. 27, 1894.
Louis A. Aumann . . . Agt. Chicopee Mills, Dwight Mfg. Co., Chicopee, Mass. . . Apr. 25, 1907.
George A. Ayer . . . Supt. West Boylston Co. . . . . Easthampton, Mass. . Apr. 24, 1895.
Nathaniel F. Ayer . . . Asst. Mgr. Farwell Bleachery, ... 70 Kilby St., Boston, Mass. . . . Apr. 25, 1901.

J. W. Bailey . . . . . Principal, The Bradford Durfee Textile School . . . . . Fall River, Mass. . . Apr. 23, 1903.
Dickerson G. Baker . . Mech. Eng., American Thread Co. . . . . P. O. Box B, Willimantic. Conn. . Oct. 18, 1900.
Edwin H. Baker . . . Bliss, Fabyan & Co., Box 2899 . . . . . 117 Duane St., New York, N. Y. Apr. 24, 1878.
Wallace L. Ball . . . Agt. Consolidated Cotton Duck Company, Columbia Mills Co. . . . . Columbia, S. C. . . Apr. 26, 1906.
Joseph W. Ballard . . Supt. Griswoldville Mfg. Co. . . . . Griswoldville, Mass., Apr. 26, 1906.
Edward R. Ballou . . . Treas. Ballou Yarn Co., ... 189 Charles St., Providence, R. I. . . Apr. 25, 1894.
Frederick D. Ballou . . Supt. W. A. Slater Mills . . . . . Jewett City, Conn. . Apr. 23, 1903.
V. T. Barber . . . . . Supt. Slater Cotton Co., 9 Beech St., Pawtucket, R. I. . . Oct. 2, 1902.
J. E. Barbour . . . . Prest. Barbour Flax Spinning Co. . . . . 418 Grand St., Paterson, N. J. . . . Apr. 28, 1904.
Louis B. Barker . . . Agt. United States Cotton Co. . . . Central Falls, R. I. . Apr. 27, 1899.
Harold C. Barnefield . Treas. Hays Textile Co. . . . . Pawtucket, R. I. . . Apr. 26, 1906.
Lewis E. Barnes . . . Agt. Pemberton Co. & Methuen Co., Methuen, Mass. . . . Oct. 25, 1895.
Thomas Barrett, Jr. . . Prest. Langley & Aiken Mills . . . Augusta, Ga. . . . . Apr. 26, 1900.
Edward E. Bartlett . . Supt. Parker Mills, No. 2 . . . . . Warren, R. I. . . . Sept. 22, 1904.
Edwin N. Bartlett . . . Supt. Edwin Bartlett Co., ... North Oxford, Mass. . Apr. 29, 1891.
Daniel Moore Bates . Asst. Supt. Joseph Bancroft & Sons Co., ... Rockford, Wilmington, Del. . . Apr. 27, 1898.
William M. Batt . . . The Davol Mills . . . . . Box 73, Fall River, Mass. . . Apr. 26, 1906.
Joseph P. Battles . . . Treas. The Textile Mach. Specialty Co., Lawrence, Mass. . . . . Res. 5 Earl St., Malden, Mass. . . . Oct. 25, 1895.
Edward C. Beach . . Gen. Mgr. Gate City Cotton Mills . East Point, Georgia . Oct. 5, 1899.
C. Enos Bean . . . . Agt. Lawrenceville Mfg. Co. . . . Lawrenceville, Ga. . Apr. 24, 1902.
George W. Bean . . . Agt. Androscoggin Mills . . . . . Lewiston, Me. . . . Apr. 17, 1872.
Robert Beatty . . . . Robert Beatty & Co. . . . . Coral and Adams Sts., Philadelphia, Pa. . . Oct. 28, 1897.

Digitized by Google

John W. Bell . . . . . Asst. Treas. and Gen. Mgr. Smith & Dove Manufg. Co. . . . . Andover, Mass. . . . Oct. 28, 1897.
Albert Farwell Bemis . Prest. Jackson Fibre Co., (Jackson, Tenn.) . . . . . P. O. Box 5173, 89 State St., Boston, Mass. . . . Apr. 23, 1903.
Orin F. Bennett, . . . Supt. Naumkeag Steam Cotton Co. . . . . 5 Cherry St., Salem, Mass. . . . . Sept. 13, 1906.
A. C. Bent . . . . . Agt. Safety Seamless Pocket Co. . . Taunton, Mass. . . . Oct. 28, 1897.
William H. Bilbrough . Sec'y and Treas. Elmira Knitting Mills and Mgr. Conewawah . . . . . Spinning Co., Elmira, N. Y. . . . . Apr. 24, 1902
R. Bloss Billings . . . Treas. and Mgr. Utica Dyeing Co. . Utica, N. Y. . . . . Apr. 25, 1907.
John H. Binns . . . . Supt. Dyeing & Finishing Arlington Mills, Thornfield . . . . . Methuen, Mass. . . Apr. 26, 1906.
John B. Bird . . . . . Engineer Joseph Bancroft & Sons Co. Wilmington, Del. . Apr. 26, 1906.
Louis W. Bishop . . . Prest. and Treas. Blackstone Webbing Co. . . . . Pawtucket, R. I. . . Apr. 25, 1907.
Robert Bishop . . . . Robert Bishop Mfg. Co. . . . . 157 West 6th St., South Boston, Mass., Apr. 26, 1906.
W. N. Blackstone . . { Treas. Attawaugan Co. / Treas Totokett Mills Co. } . . . . Norwich, Conn. . . . Apr. 29, 1896.
Wm. Washington Blades, Gen. Supt. Lorraine Mfg. Co. . . . . 135 Mineral Spring Ave., Pawtucket, R. I. . . Oct. 25, 1893.
Charles Ray Blake . . Asst. Supt. Tremont and Suffolk Mills . . . . . 141 Cabot St., Lowell, Mass. . . . Sept. 21, 1905.
William S. Blakeley . . Prest. The Arashapa Co. . . . . Chester, Pa. . . . . Sept. 21, 1905.
Edward R. Blanchard . Mgr. Glenlyon Dye Works, Phillipsdale Branch . . . . . 25 Elmgrove Ave., Providence, R. I. . . Apr. 26, 1906.
Robert C. Blood . . . John Blood & Co. . . . . 7th and Somerset Sts., Philadelphia, Pa. . . Apr. 26, 1906.
Harry H. Blunt . . . Treas. Wonolancet Company . . . Nashua, N. H. . . . Apr. 25, 1907.
T. Ashby Blythe . . . Prest. Ashby Cotton Mills, ... 114 Chestnut St., Philadelphia, Pa. . . Oct. 28, 1897.
John P. Bodge . . . . Treas. Arkwright Mills . . . . . Fall River, Mass. . . Oct. 28, 1897.
J. C. Bolon . . . . . Supt. Lancaster Mfg. Co. . . . . Lancaster, Mass. . . Apr. 25, 1907.
J. B. Bolton . . . . . Supt. New York Mills . . . . . New York Mills, N. Y. Apr. 26, 1906.
George H. Booth . . . Agt. Gosnold Mill, ... New Bedford, Mass. . Apr. 25, 1907.
Joseph W. Booth . . . Asst. Supt. Atlantic Mills . . . . . Providence, R. I. . . Apr. 25, 1907.
Charles N. Borden . . Treas. Richard Borden Mfg. Co. . . Fall River, Mass. . . Apr. 25, 1907.
Jefferson Borden, Jr. . Supt. Fall River Bleachery Co. . . . Fall River, Mass. . . Apr. 21, 1899.
Nathaniel B. Borden . Treas. Barnard Manufg. Co. . . . . Fall River, Mass. . . Oct. 15, 1873.
Norman E. Borden . . Sec. Lowell Weaving Co. . . . . Lowell, Mass. . . . Apr. 26, 1906.
Raymond D. Borden . Treas. Watuppa Mills, ... Taunton, Mass. . . . Sept. 22, 1904.
E. S. Boss . . . . . Agt. American Thread Co. . . . . Willimantic, Conn. . Oct. 29, 1879.
A. E. Bosworth . . . . Supt. Bernon Mills . . . . . Georgiaville, R. I. . . Oct. 2, 1902.
Henry Deane Bourne . Treas. Hooksett Mfg. Co., ... 1741 Elm St. Manchester, N. H. . Oct. 18, 1900.
Stephen N. Bourne . . Agt. Dundee Mills, Hooksett . . . . . 971 Chestnut St., Manchester, N. H. . Oct. 21, 1868.

Digitized by Google

Frank A. Bowen . . . Supt. Appleton Co. . . . . Lowell, Mass. . . . Apr. 28, 1897.
William V. Boyd . . . Asst. to Mgr. Canadian Col'd Cotton Mills Co. . . . . P. O. Box 76, Cornwall, Ont. . . . Apr. 26, 1906.
Arthur F. Brackett . . . . 10 Oakland Ave., (Eden Park) Providence, R. I. . . Oct. 25, 1895.
Albert W. Brainerd . . . . . Box 33, Lawrence, Mass. . . Apr. 27, 1898.
S. Parker Bremer . . . Treas. Monadnock Mills . . . . . 4 Winthrop Sq., Boston, Mass. . . . Oct. 2, 1902.
Ernest Bridge . . . . Supt. Jas. Chadwick & Bro. Ltd. . . Jersey City, N. J. . . Apr. 24, 1895.
Joseph Brierley . . . . Supt. W. C. Plunkett & Sons Warp Mill, ... 33 Summer St., Adams, Mass. . . . Sept. 21, 1905.
George T. Briggs . . . Prest. and Gen. Mgr. The Briggs Mfg. Co. . . . . Voluntown, Conn. . Apr. 24, 1902.
Jas. T. Broadbent . . Instr. Carding and Spinning, Bradford Durfee Textile School, ... Fall River, Mass. . . Apr. 28, 1904.
Edward Bromley . . . Member of Firm of John Bromley & Sons . . . . . Lehigh Ave. & Front St., Philadelphia, Pa. . . Apr. 25, 1907.
Joseph H. Bromley . . Manufacturer of Lace Curtains, ... Fourth and Lehigh Ave., Philadelphia, Pa. . . Sept. 21, 1905.
Christopher P. Brooks . Prin. & Mgr. Textile Dept., International Correspondence . . . . . School . . . . . New Bedford, Mass. Apr. 28, 1897.
Henry R. Brown . . . Supt. Phenix Mill . . . . . Box 56, Phenix, R. I. . . . . Apr. 28, 1897.
Isaac A. Brown . . . . Treas. Narragansett Mills . Box 324, Fall River, Mass. . . Sept. 29, 1898.
Thomas J. Brown . . . George Brown's Sons . . . . . Mt. Joy, Pa. . . . . Oct. 28, 1897.
E. C. Bucklin . . . . Treas. Interlaken Mills . . . . . Butler's Exchange, Box 289, Providence, R. I. . . Apr. 25, 1883.
Harris H. Bucklin . . Asst. Treas. Interlaken Mills . . . Providence, R. I. . . Apr. 23, 1903.
Granville R. Budlong . Purchasing Agt. Union Wadding Co. Providence, R. I. . . Sept. 21, 1905.
E. R. Bullock, ... Mech. Eng., J. & P. Coats, Ltd., ... 38 Brook St., Pawtucket, R. I. . . Apr. 28, 1904.
Robert Burgess . . . . Treas. Burgess Mills . . . . . Pawtucket, R. I. . . Apr. 27, 1892.
Edward N. Burke . . . Lowell Machine Shop . . . . . 216 Nesmith St., Lowell, Mass. . . . Apr. 28, 1880.
Alfred H. Burnham . . Mgr. Glasgow Mills, ... Orthodox and Horrocks Sts., Frankford, . . Philadelphia, Pa. . . Apr. 26, 1900.
Charles F. Burnham . . Treas. Crefeld Waste and Batting Co., ... and The L. A. Lockwood Co. . . . Saylesville, R. I. . . Sept. 21, 1905.
Hervey Burnham . . . Supt. Beaver Mills and Eclipse Mill . . . . . 234 East Main St., North Adams, Mass. . Apr. 27, 1899.
W. R. Burnham . . . . . 362 Main St., Norwich, Conn. . . . Apr. 29, 1885.
John L. Burton . . . . Supt. Bristol Mfg. Co. . . . . New Bedford, Mass. . Apr. 23, 1903.
Obadiah Butler . . . . Supt. New York Mills Co. . . . . P. O. Box 14, New York Mills, Oneida County, N. Y. Sept. 13, 1906.
Paul Butler . . . . . Prest. Whittier Mills, Chattahoochee, Ga. . . . . Lowell, Mass. . . . Apr. 25, 1907.
Samuel T. Butterworth . Supt. Baltic Mills Co., P. O. Box 103, Baltic, Conn. . . . Sept. 21, 1905.

Digitized by Google

William H. Cadwell . . Agt. Jackson Company . . . . . Nashua, N. H. . . . Apr. 26, 1900.
John P. Campbell . . . Asst. Treas. New York Mills, New York Mills, ...
. . . . . Oneida Co., N. Y. . Sept. 22, 1896.
Byron F. Card . . . . . Tallassee, Elmore Co., Ala. . . Apr. 25, 1888.
Hamilton Carhartt . . Prest. Hamilton Carhartt Cotton Mills, Rock Hill, S. C. . . Apr. 25, 1907.
D. Allison Carrick . . Treas. Sycamore Mills, 65 Franklin St., Boston, Mass. . . . Apr. 25, 1907.
Stewart F. Carter . . . Tech. Chemist, Glenlyon Dye Works, Saylesville, R. I. . . Apr. 26, 1906.
Arnold B. Chace . . . Treas. Valley Falls Co. . . . . Albion, R. I. . . . . Apr. 26, 1906.
Benjamin C. Chace, Jr. . Care Jenckes Spinning Co. . . . . Pawtucket, R. I. . . Sept. 21, 1905.
Malcolm G. Chace . . Prest. Naushon Mfg. Co. . . . . Valley Falls, R. I. . . Sept. 21, 1905.
Alfred M. Chadwick, . Asst. Agt. Tremont & Suffolk Mills, Lowell, Mass. . . . Apr. 28, 1904.
Simeon B. Chase . . . Treas. King Philip Mills . . . . . Fall River, Mass. . . Apr. 21, 1875.
E. G. Chester . . . . Prop. E. G. Chester Hosiery Co. . . . . .
. . . . . Cedar and Huntingdon Sts., Philadelphia, Pa. . . Sept. 21, 1905.
Chas. E. Childs . . . . Treas. Hampton Co., Asst. Treas. West Boylston Co. . . .
. . . . . Northampton, Mass. . Oct. 1, 1903.
Clarence N. Childs . . Agt. Hamilton Manufg. Co. . . . . .
. . . . . Jackson St., Lowell, Mass. . . . Apr. 24, 1895.
Elmer G. Childs . . . Agt. Boston Duck Co. . . . . Bondsville, Mass. . . Oct. 26, 1892.
Jno. H. C. Church . . . Treas. and Gen. Mgr. Monument Mills, Great Barrington Mass. Apr. 28, 1897.
Alfred L. Clark . . . . Supt. Greene & Daniels Mfg. Co. . . . . .
. . . . . 32 Central Ave., Pawtucket, R. I. . . Apr. 25, 1907.
Avery B. Clark, ... Supt. Merrimack Mfg. Co. . . . . Lowell, Mass. . . . Apr. 27, 1905.
Ernest E. Clark . . . Supt. Williamsville Mfg. Co. . . . . Killingly, Conn. . . Apr. 29, 1896.
William Clark . . . . Agt. Wm. Clark Mills, American Thread Co. . . . . .
. . . . . Westerly, R. I. . . Sept. 21, 1905.
E. N. Clemence . . . Cotton Manufacturer . . . . . Charlotte, N. C. . . . Apr. 28, 1897.
W. H. Cloher, Jr. . . . Prest. Utica Cotton Co., . Capron, Oneida Co., N. Y., . Sept. 22, 1896.
Alfred M. Coats . . . Gen. Mgr. J. & P. Coats, L't'd. . . . . .
. . . . . 13 Brown St., Providence, R. I. . . Sept. 21, 1905.
W. C. Cobb . . . . . Supt. Ware Shoals Mfg. Co. . . . . Ware Shoals, S. C. . Apr. 26, 1906.
Josiah G. Coburn . . . . . 99 Washington St., Newton, Mass. . . . Apr. 20, 1865.
Charles H. Collins . . Supt. Berkeley Co. . . . . Ashton, R. I. . . . . Apr. 26, 1900.
John A. Collins . . . . Supt. American Linen Co. . . . . .
. . . . . 73 Cottage St., Fall River, Mass. . . Oct. 31, 1883.
Frank B. Comins . . . Treas. American Moistening Co. . . . . .
. . . . . 79 Milk St., Room 901, Boston, Mass. . . . . Oct. 28, 1891.
Caesar Cone . . . . . Prest. Proximity Mfg. Co. . . . . Greensboro, N. C. . . Apr. 26, 1900.
William A. Congdon . Agt. Whitman Mills, 720 County St., New Bedford, Mass. Apr. 26, 1906.
John J. Connell . . . . Agt. Tremont & Suffolk Mills . . . Lowell, Mass. . . . Apr. 27, 1892.
Halsey Connett . . . . Supt. Clark Mile End Spool Cotton Co. East Newark, N. J. . Oct. 2, 1902.
G. Arthur Cook . . . . Sec'y West Boylston Mfg. Co. . . . Easthampton, Mass. . Apr. 25, 1907.
Reuben A. Cooke . . . Treas. Queen City Cotton Co. . . . . .
. . . . . Lake Side Ave., Burlington, Vt. . . . Sept. 13, 1906.
Robert A. Copeland . . Supt. Yarn Mills, Perry Knitting Co. . . . . .
. . . . . P. O. Box 4765, Perry, New York . . Apr. 26, 1906.

Digitized by Google

Peter H. Corr . . . . Treas. Greenwich Bleachery . . . . Taunton, Mass. . . . Apr. 24, 1895.
Frank H. Cotton . . . . . Fayetteville, N. C. . .Apr. 27, 1899.
Lyman M. Cousens, . . Prest. Dana Warp Mills, 164 Myrtle St., Portland, Me. . . Apr. 24, 1902.
Thomas D. Covel . . . Treas. The Covel and Osborne Co. . Fall River, Mass. . . Apr. 26, 1906.
Richard Cowell . . . . . 81 Mt. Pleasant St., New Bedford, Mass. . Apr. 24, 1902.
Amos Crankshaw . . . Supt. Cotton Yarn Dept., Lorraine Mfg. Co. . . . . Pawtucket, R. I. . . Apr. 25, 1907.
L. B. Cranska . . . . Floyd Cranska Mills . . . . . Moosup, Conn. . . . Sept. 21, 1905.
William W. Crapo . . Prest. Wamsutta Mills . . . . . New Bedford, Mass. . Sept. 29, 1898.
Mark B. Creed . . . . Supt. 1, 2, 3 Wamsutta Mills . . . New Bedford, Mass. . Oct. 1, 1903.
George Crompton . . . Supt. Middlesex Bleachery, ... 53 Bay State Ave., Somerville, Mass. . . Apr. 25, 1907.
George Crompton, . . Treas. Wachusett Mills and member firm Crompton-Thayer . . . . . Loom Co., Worcester, Mass. . . Oct. 28, 1897.
William W. Crosby . . 53 State St., Room 1110, Boston, Mass. . . . . Res. 8 Court St., Woburn, Mass . . . Sept. 21, 1905.
John A. Crossland . . Asst. Supt. Skenandoa Cotton Co. . Utica, N. Y. . . . . Apr. 25, 1907.
John Crowther . . . . Treas. Shannock Narrow Fabric Co., Pawtucket, R. I. . . Apr. 25, 1907.
John B. Cudlip . . . . Mgr. Cornwall & York Cotton Mills Co. . . . . St. John, N. B. . . . Apr. 28, 1897.
H. H. Culver . . . . . Supt. Elizabeth Poole Mills . . . . . 8 Coram St., Taunton, Mass. . . . Apr. 28, 1897.
Henry S. Culver . . . Treas. Westville Cotton Mills . . . Taunton, Mass. . . . Apr. 28, 1897.
A. G. Cumnock . . . . Treas. Appleton Co. . . . Box 2284, Lowell, Mass. . . . July 19, 1865.
Frederick E. Cunneen . Asst. Supt. Seaconnet Mills, . . . Fall River, Mass. . . Apr. 26, 1906.
Andrew J. Currier . . . Agt. Nonquitt Spinning Co. . . . . New Bedford, Mass. . Apr. 25, 1888.

Philip Dana . . . . . Supt. Dana Warp Mills . . . . . Westbrook, Me. . . Sept. 29, 1898.
Woodbury K. Dana . . Treas. Dana Warp Mills . . . . . Westbrook, Me. . . . Apr. 25, 1888.
H. M. Daniel . . . . Phila. Mgr. { The Mayo Mills / The Avalon Mills } . . . . . 517 The Bourse, Philadelphia, Pa. . . Sept. 21, 1905.
A. Lockwood Danielson Asst. Treas. Quinebaug Co. . . . . Providence, R. I. . . Sept. 27, 1894.
J. DeForest Danielson { Asst. Treas. Lockwood Co. & Lewiston Bleachery & Dye Works } Providence, R. I. . . Sept. 27, 1894.
John W. Danielson . . Treas. Lockwood Co., Ponemah Mills, Quinebaug Co., Waureganc Co., Lewiston B. & D. Works, Box 900, Providence, R. I. . . July 15, 1868.
Bradford D. Davol . . Prest. Barnard Mfg. Co., P. O. Box 93, Fall River, Mass. . . Apr. 25, 1877.
Albert Deabill . . . . Supt. Lowell Hosiery Co. . . . . Lowell, Mass. . . . Apr. 25, 1901.
Augustus De Cort . . . Treas. De Cort Yarn Co., ... 724 Exchange Building, Boston, Mass. . . . Apr. 26, 1900.
George DeForest . . . Prest. Utica Steam & Mohawk Valley Cotton Mills . . . . . Utica, New York . . Oct. 28, 1897.
George Delano . . . . Supt. Bourne Mills . . . . . Fall River, Mass. . . Apr. 26, 1906.
Henry B. Deming . . Prest. Deming Braiding Co., Box 555, Providence, R. I. . . Apr. 26, 1906.

Digitized by Google

William P. Dempsey . Treas. and Mgr. Dempsey Bleachery and Dye Works . . . . . Pawtucket, R. I. . . Apr. 28, 1886.
Charles W. Dennett . . Vice Prest. and Gen. Mgr. Hadley Mills, ... So. Hadley Falls, Mass. . Oct. 29, 1890.
Harlan Ingalls Dennett, Supt. Hadley Mills . . . . . So. Hadley Falls, Mass. . Apr. 27, 1905.
Arthur W. Dennis . . Prest. and Treas. Elmwood Mills . . . . . Dexter, Daboll and Maroney Sts., Providence, R. I. . . Sept. 21, 1905.
Edward P. Dennis . . . . . 50 Chelmsford St., Lowell, Mass. . . . Apr. 25, 1888.
P. Y. DeNormandie . . Treas. Pepperell Mfg. Co. . . . . 30 Kilby St., Boston, Mass. . . . Apr. 29, 1896.
Charles Owen Dexter . Agt. Beacon Mfg. Co. . . . . New Bedford, Mass., Apr. 24, 1895.
George O. Dexter . . . Supt. Canadian Colored Cotton Mills Co. Hamilton, Ont. . Apr. 27, 1905.
Henry C. Dexter . . . Agt. and Sec'y. Greene & Daniels Mfg. Co. . . . . Pawtucket, R. I. . . Apr. 25, 1901.
Lewis Dexter, Jr. . . . Agt. Warner Cotton Mills . . . . . Newburyport, Mass., Apr. 27, 1899.
Albert W. Dimick . . . Agt. Fisher Mfg. Co. . . . . Fisherville, Mass. . . Apr. 25, 1894.
Bradford C. Divine . . Supt. and Mgr. Utica Willowvale Bleaching Co. . . . . Chadwicks, Oneida Co., N. Y. . . Apr. 27, 1899.
Charles S. Doggett . . Director, Textile Dept. Clemson College . . . . . Clemson College, S. C. Apr. 26, 1906.
Robert Dow . . . . . Treas. Solway Dyeing & Textile Co., Pawtucket, R. I. . . April 25, 1901.
Arthur J. Draper . . . { Treas. Hoskins, Louise Calvine and Dover Yarn Mills . . . . . Charlotte, N. C. . . Apr. 23, 1903.
{ Treas. The Pell City Mfg. Co. . . Pell City, Ala. . . .
Eben S. Draper . . . Agt. Draper Co. . . . . Hopedale, Mass. . . Oct. 31, 1888.
George A. Draper . . . Treas. Draper Co. . . . . Hopedale, Mass. . . Oct. 31, 1888.
George Otis Draper . . Sec'y Draper Co. . . . . Hopedale, Mass. . . Apr. 24, 1895.
William F. Draper . . Prest. Draper Co. . . . . Hopedale, Mass. . . July 17, 1867.
Henry C. Dresser . . . Supt. Stonewall Cotton Mills, . . . Stonewall, Miss. . . . Apr. 27, 1905.
Harry K. Drew . . . Supt. Fulton Bag and Cotton Mills . Atlanta, Ga. . . . . Apr. 24, 1902.
O. D. Drew . . . . . Supt. Royal, Valley Queen and Arctic Mills . . . . . Riverpoint, R. I. . . Oct. 2, 1902.
James B. Duggan . . . . . 41 Jewett Place, Utica, N. Y. . . . . Oct. 2, 1902.
Frederic C. Dumaine, . Treas. Amoskeag Mfg. Co., Box 2879 . . . . . 64 Ames Building, Boston, Mass. . . . April 25, 1901.
George W. Dunn . . . Purchasing Agt. Lancaster Mills . . Clinton, Mass. . . . Apr. 25, 1907.
John H. Dunn . . . . Gen. Supt. Tremont & Suffolk Mills Lowell, Mass. . . . Oct. 1, 1903.
Frank J. Dutcher . . . Asst. Agt. Draper Co. . . . . Hopedale, Mass. . . Apr. 24, 1902.
Frank H. Dwelly . . . Treas. Tecumseh Mills . . . . . Fall River, Mass. . . Apr. 27, 1899.
David H. Dyer . . . . D. H. Dyer & Son, Mill Engineers, P. O. Box 582, ... Citizens' Bank Building, Fall River, Mass. . . Oct. 18, 1871.

Charles H. Eames . . Principal Lowell Textile School . . Lowell, Mass. . . . Apr. 25, 1907.
Benjamin M. Earle . . Prop. Merchants Dye Works . . . . East Dedham, Mass. Sept. 26, 1901.
Russell W. Eaton . . . Agt. Cabot Manufg. Co. . . . . Brunswick, Me. . . . Oct. 27, 1887.

Digitized by Google

John Eccles . . . . . Agt. Ponemah Mills . . . . . Taftville, Conn. . . . Apr. 27, 1892.
Jesse P. Eddy, Jr., . . Asst. Treas. Tillinghast Stiles Co., and Prest. and Treas.
. . . . . Fitch Mfg. Co., P. O. Box 1566, Providence, R. I. . . Sept. 21, 1905.
Oscar Elsas . . . . . Vice-Prest. Fulton Bag & Cotton Mills, ...
. . . . . P. O. Box 773, Atlanta, Ga. . . . . Apr. 28, 1897.
William E. Elsberry . . Sec'y and Treas. Tallassee Falls Mfg. Co. . . . . .
. . . . . Tallassee, Ala. . . . Sept. 13, 1906.
Frederick W. Ely . . . Agt. Columbian Manufg. Co. . . . Greenville, N. H. . . Apr. 25, 1888.
H. B. Estes . . . . . Agt. Continental Mills . . . . . Lewiston, Me. . . . Apr. 26, 1893.
John H. Estes . . . . Cotton Manufacturer . . . . . Fall River, Mass. . . Apr. 23, 1903.
James C. Eteson . . . Supt. Orswell Mills, ... Fitchburg, Mass. . . Sept. 22, 1904.
William Evans . . . . Gen. Supt. Hargraves & Parker Mills, ...
. . . . . 295 Winter St., Fall River, Mass. . Apr. 29, 1896.
D. A. Everly . . . . . 371 Broadway, Pawtucket, R. I. . . Apr. 24, 1902.

Wm. Kendall Fairbanks Agt. Bigelow Carpet Co., Market St., Lowell, Mass. . . . Apr. 25, 1907.
Charles F. Farrar . . . . . 49 Coggeshall St., Fall River, Mass. . . Oct. 28, 1897.
George E. Farrell . . . Sec'y. Ontario Knitting Co. and Standard Yarn Mills . .
. . . . . Oswego, N. Y. . . . Oct. 18, 1900.
James T. Ferguson . . Supt. Warwick Mills . . . . . Centreville, R. I. . . Oct. 5, 1899.
John A. Fernley . . . Supt. Butler Mill . . . . . New Bedford, Mass. . Sept. 22, 1904.
Frank S. Field . . . . Asst. Treas. Massaemit Yarn Mills . Shattuckville, Mass. . Oct. 25, 1895.
Eugene Finocchiaro . . . . . 532 Broadway, Chelsea, Mass. . . . Apr. 28, 1904.
William Firth . . . . Prest. American Moistening Co. & Wm. Firth Co. . . . .
. . . . . 79 Milk St., Boston, Mass. . . . Apr. 25, 1888.
George Fish . . . . . Treas. & Mgr. Knapp Spinning Mills, Richmond, Me. . . Apr. 27, 1905.
Henry E. Fisher . . . Vice-Prest. & Treas. Atlanta Cotton Mills, Atlanta, Ga. . . . . Oct. 25, 1895.
Frederick A. Flather . Treas. Boott Mills, . . 79 Milk St., Boston, Mass. . . . . Apr. 29, 1891.
F. C. Fletcher . . . . Vice Prest. Lawton Spinning Co. . . . . .
. . . . . 621 Banigan Building, Providence, R. I. . . Oct. 18, 1900.
Benjamin Forster . . . Supt. Weaving, I. E. Palmer Mill . . . . . .
. . . . . 71 Spring St., Middletown, Conn. . Apr. 26, 1906.
Henry J. Forsyth . . . Supt. Cooleemee Cotton Mill, . . . Cooleemee, N. C. . . Oct. 1, 1903.
Eugene N. Foss . . . Prest. Burgess Mills, . 34 Oliver St., Boston, Mass. . . . Apr. 25, 1907.
John W. Foster . . . . Asst. Supt. Print Works, Hamilton Mfg. Co. . . . . .
. . . . . 36 Gates St., Lowell, Mass. . . . Apr. 26, 1906.
M. F. Foster . . . . . Milford, N. H. . . . Apr. 17, 1872.
Edward W. France . . Dir. of Philadelphia Textile School, ...
. . . . . 320 So. Broad St., Philadelphia, Pa. . . Sept. 22, 1896.
John W. France . . . Supt. The Aberfoyle Mfg. Co., and the Galey & Lord Mfg. Co.
. . . . . 427 East Broad St., Chester, Pa. . . . . Sept. 21, 1905.
Allan A. Freeman . . Prest. Atlantic Fibre Co., Sloatsburg, Rockland Co., N. Y. Apr. 25, 1907.
Arthur C. Freeman . . Textile Finishing Machinery Co. . . . . .
. . . . . 83 Exchange Place, Providence, R. I. . . Apr. 27, 1899.

Digitized by Google

Simon Friedberger . . Prest. Friedberger-Aaron Mfg. Co. . . . . Tenth and Diamond Sts., Philadelphia, Pa. . . Apr. 23, 1903.

John W. Fries . . . { Managing Partner, F. & H. Fries & Prest. Arista Mills Co. . . . } Winston-Salem, N.C., . Oct. 18, 1900.

C. H. Frisbie . . . . Agt. Attawaugan Co. . . . . Norwich, Conn. . . . Oct. 29, 1890.

Hachiro Henry Fukuhara, Supt. Sumoto Mill, Kanegafuchi Spinning Co. . . . . Hiogo, Japan, . . . Apr. 28, 1904.

S. L. Gabriel . . . . . Treas. United States Linen Co. . . Taunton, Mass. . . . Sept. 22, 1904.

W. T. Galey . . . . . Prest. Aberfoyle Manufg. Co. . . . Chester, Pa. . . . . Apr. 28, 1897.

William Gammell . . . Agt. Berkeley Co. . . . . Providence, R. I. . . Oct. 28, 1885.

Arnold C. Gardner . . Treas. Manomet Mills, 76 Bedford St., New Bedford, Mass. Apr. 26, 1906.

James G. Garland . . . Prest. The Garland Mfg. Co. . . . Saco, Me. . . . . Oct. 29, 1879.

William H. Garner . . Agt. Newmarket Mfg. Co. . . . . Newmarket, N. H. . Sept. 22, 1904.

Edward T. Garsed . . . . . Charlotte, N. C. . . Apr. 27, 1898.

Walter R. Garsed . . . Mgr. Wingohocking Cotton Mills . . . . . Frankford, Philadelphia, Pa. . . Oct. 1, 1903.

E. Stanley Gary . . . Vice Prest. and Gen. Mgr. Gary Mfg. Co. . . . . 724 Equitable Bldg. Baltimore, Md. . . . Oct. 1, 1903.

James A. Gary . . . . Prest. Gary Mfg. Co. . . . . 720–724 Equitable Bldg., Baltimore, Md. . . . Apr. 25, 1883.

Alfred C. Gaunt . . . Treas. Tremont Worsted Co. . . . Methuen, Mass. . . Apr. 25, 1907.

James Gee . . . . . Supt. Interlaken Dye Works . . . . Fiskville, R. I. . . . Apr. 27, 1898.

S. P. Gerow . . . . . Sec'y The Cornwall & York Cotton Mills . . . . . St. John, N. B. . . . Apr. 25, 1907.

Charles E. Getchell . . Prest. Waltham Emery Wheel Co. . . . . 115 Bacon St., Waltham, Mass. . . . Oct. 30, 1889.

R. H. I. Goddard, Jr., . Goddard Bros. . . . . Providence, R. I. . . Apr. 27, 1905.

William C. Godfrey . . Agt. Indian Orchard Co. . . . . Indian Orchard, Mass. Oct. 29, 1890.

Otto Goetze, ... Gen'l. Mgr. Glasgow Mills, Orthodox and Horrocks Sts., ... Frankford, Philadelphia, Pa. . . Apr. 24, 1902.

Albert H. Goff . . . . Mill Supt. D. Goff & Son, 29 River St., Pawtucket, R. I. . . Apr. 25, 1907.

Lyman B. Goff . . . . Prest. Union Wadding Co. . . . . Pawtucket, R. I. . . Sept. 21, 1905.

Alfred M. Goodale . . Cloth & Yarn Broker . 40 State St., Boston, Mass. . . . . Apr. 25, 1883.

C. B. Gordon . . . . . Vice Prest. Dominion Textile Co., Ltd. . . . . 112 St. James St. Montreal, P. Q. Canada Sept. 13, 1906.

Frederick B. Gordon . Prest. Columbus Mfg. Co. . . . . Columbus, Ga. . . . Apr. 26, 1900.

Charles H. Gorton . . Aragon Mills . . . . . Aragon, Ga. . . . . Apr. 25, 1894.

J. Whidden Graham . Supt. St. Croix Mill, Canadian Col'd Cotton Mill Co. . . . . Milltown, New Brunswick . . Apr. 26, 1906.

George P. Grant, Jr. . . Treas. Grant Yarn Co. . . . . Fitchburg, Mass. . . Sept. 27, 1894.

D. W. Gray . . . . . Manager La Tosca Spinning Co., . . Utica, N. Y. . . . . Oct. 26, 1892.

R. A. Gray . . . . . Supt. Rodman Manufg. Co. . . . . Allenton, R. I. . . . Apr. 24, 1895.

Edwin Farnham Greene, Treas. Dwight Mfg. Co. & Prest. Lockwood, Greene & Co. . . . . 53 State St., Boston, Mass. . . . Apr. 24, 1902.

Digitized by Google

Joseph Warren Greene . Supt. Hamilton Web Co. . . . . Hamilton, R. I. . . . Apr. 29, 1896.
William C. Greene . . Treas. Peace Dale Manufg. Co. . . Peace Dale, R. I. . . Oct. 27, 1886.
John T. Greenwood . . R. Greenwood & Bault . . . . . .
. . . . . 4720 Leiper St., Frankford, Philadelphia, Pa. . . Apr. 26, 1900.
S. Greenwood . . . . Mgr. Canadian Col'd Cot. Mills Co. Ltd. . . . . .
. . . . . Cornwall, Ontario . . Oct. 5, 1899.
William K. Greer . . . Asst. Supt. Eclipse & Beaver Mills . . . . . .
. . . . . P. O. Box 258, North Adams, Mass. Apr. 26, 1906.
John Gregson . . . . Peabody Mfg. Co. . P. O. Box 304, Newburyport, Mass. . Apr 24, 1895.
Maxwell Grierson . . . Gen. Mgr. Jas. Chadwick & Bro., Ltd., Jersey City, N. J. . . Apr. 27, 1898.
Adam H. Groel . . . Supt. Clark Mile End Spool Cotton Co. East Newark, N. J. . Sept. 21, 1905.
David Grove . . . . . Supt. U. S. Cotton Co. . . . . Central Falls, R. I. . Apr. 27, 1898.
George W. Grove . . . Treas. Argo Mills Co. . . . . Gloucester City, N. J. Sept. 21, 1905.
Henry S. Grove . . . Prest. Argo Mills Co., ...
. . . . . 318 Marine and Merchant Bldg., Philadelphia, Pa. . . Apr. 27, 1898.
Louis I. Guion . . . . Supt. Columbia Mills Co., Box 130 . Columbia, S. C. . . . Oct. 2, 1902.
Percy Gulline . . . . Supt. Merrimack Print Works, ...
. . . . . 197 Pawtucket St., Lowell, Mass. . . . Sept. 21, 1905.
Arthur H. Gulliver . . . . . P. O. Box 37, Norwich Town, Conn. Apr. 24, 1889.
Frank B. Gustafson . . Asst. Supt. I. E. Palmer Cotton Spinning Mill . . . . .
. . . . . 88 Willis Ave., Middletown, Conn. . Apr. 26, 1906.

William J. Hadfield . . Supt. Harrison & Gore Silk Mills . . . . . .
. . . . . 124 Smith St., Newburgh, N. Y. . . Apr. 27, 1899.
Frank J. Hale . . . . Gen. Agt. Saco and Pettee Machine Shops . . . . . .
. . . . . Newton Upper Falls, Mass. . Apr. 27, 1892.
Walter B. Hall . . . . Supt. Hamilton Mfg. Co. . . . . Lowell, Mass. . . . . Apr. 25, 1901.
William E. Hall . . . Treas. and Mgr. Shaw Stocking Co., Lowell, Mass. . . . Apr. 27, 1892.
Z. D. Hall . . . . . Supt. Berkshire Cotton Mfg. Co. . . . . .
. . . . . 70 Orchard St., P. O. Box 963, Adams, Mass. . . . Oct. 29, 1879.
William Halliwell . . . Mgr. Ingrahamville Dye Works . . Pawtucket, R. I. . . Sept. 21, 1905.
William Halliwell, . . Agt. Providence and Woonsocket Mills of the Lawton Spin-
. . . . . ning Co., Woonsocket, R. I. . Sept. 26, 1901.
Alton L. R. Hambly, . Supt. Quidnick Mfg. Co. . . . . Quidnick, R. I. . . Apr. 26, 1906.
John H. Hambly . . . Treas. Quidnick Manufg. Co. . . . . .
. . . . . 49 Westminster St., Providence, R. I. . . Apr. 24, 1895.
Maylin Hamburger . . . . . Middletown, Conn. . Sept. 21, 1905.
Arthur M. Hamilton . . . . . 267 Hanover St., Fall River, Mass. . . Apr. 28, 1897.
John F. Hamlet . . . Manufacturer . . . P. O. Box 160, Fall River, Mass. . . Oct. 31, 1888.
Peter Hardman . . . Supt. American Thread Co., Willimantic Mills . . . . . .
. . . . . 137 South Main St., Willimantic, Conn. . Apr. 23, 1903.
J. Potter Harrington . Supt. Saratoga Victory Mills . . . . Victory Mills, N. Y. . Apr. 25, 1907.
A. G. Harris . . . . . West Warren Cotton Mills, ... West Warrren, Mass. Sept. 26, 1901.
Henry F. Harris . . . Treas. West Boylston Manufg. Co. . . . . .
. . . . . 340 Main St., Worcester, Mass. . . Apr. 30, 1890.

Digitized by Google

Charles E. Harrison . . Mgr. Harrison Yarn & Dyeing Co. Pawtucket, R. I. . . Sept. 22, 1904.
W. G. Hartford . . . Treas. & Mgr. Monarch Woolen Mills Montville, Conn. . . Apr. 23, 1903.
Frank Hartley . . . . Supt. S. Slater & Sons, Inc. Print and Dye Works . . . .
. . . . . Webster, Mass, . . . Apr. 27, 1905.
Walter M. Hastings . . Asst. to Agt. Arlington Mills . . . Lawrence, Mass. . . Apr. 23, 1903.
Chester D. Hatch . . Agt. Exeter Mfg. Co., ... Exeter, N. H. . . . . Apr. 28, 1904.
William E. Hatch . . Prest. New Bedford Textile School, ...
. . . . . 166 William St., New Bedford, Mass. . Sept. 22, 1904.
William Hathaway . . Supt. Barnard Manufg. Co. . . . . Fall River, Mass. . . Apr. 25, 1894.
William B. Hawes . . Yarn Broker . . . 108 Bedford St., ...
. . . . . P. O. Box 733, Fall River, Mass. . . Apr. 24, 1895.
Alfred Hawkesworth . Alfred Hawkesworth & Sons Co., Ltd. . . . . .
. . . . . 551 St. James St., Montreal, P. Q. . . . Apr. 26, 1893.
Fred Hawkesworth . . Alfred Hawkesworth & Sons Co., Ltd. . . . . .
. . . . . 551 St. James St., Montreal, P. Q. . . . Sept. 22, 1896.
Charles Hayes, Jr. . . Supt. Skenandoa Cotton Co. . . . Utica, N. Y . . . . Apr. 26, 1906.
William Hayes . . . . Agt. Barker Mill . . . . . Auburn, Me. . . . . Apr. 30, 1879.
Harry T. Hayward . . Prest. Forestdale Mfg. Co. . . . . Franklin, Mass. . . . Apr. 25, 1907.
William P. Heineken . Gen'l Mgr. and Sec'y Union Mf'g. and Power Co. . . . .
. . . . . Union, S. C. . . . . Apr. 26, 1906.
W. G. Henderson . . . Agt. Falls Co. . . . . Norwich, Conn. . . . Apr. 29, 1896.
A. E. Henry . . . . . Mystic, Conn. . . . Apr. 25, 1901.
James Henry . . . . . Thos. Henry & Sons . . . . . .
. . . . . Trenton Ave. and Tioga St., Philadelphia, Pa. . . Oct. 1, 1903.
William G. Henry . . Thos. Henry & Sons . . . . . .
. . . . . Trenton Ave. and Tioga St., Philadelphia, Pa. . . Oct. 1, 1903.
Arthur N. Hersom . . Supt. Mt. Vernon Mills . . . . . Baltimore, Md. . . . Apr. 28, 1904.
Ernest L. Hersom . . Supt. Nockedge Mills 40 Mechanic St., Fitchburg, Mass. . . Apr. 23, 1903.
T. I. Hickman, ... Prest. and Treas. Graniteville Mfg. Co. . . . . .
. . . . . Leonard Bldg., Augusta, Ga. . . . . Apr. 25, 1901.
Hiram Higham . . . . Supt. 4 and 5 Wamsutta Mills . . . New Bedford, Mass. . Oct. 1, 1903.
William H. Hill . . . Prest. Renfrew Mfg. Co., ...
. . . . . 50 Congress St., Room 810, Boston, Mass. . . . Apr. 24, 1902.
George H. Hills . . . Treas. Davol Mills & Stevens Mfg. Co., Fall River, Mass. . . Oct. 25, 1895.
Alexander F. Hobbs . . Resident Mgr. U. S. Finishing Co . . Providence, R. I. . . Apr. 27, 1905.
Franklin W. Hobbs . . Treas. Arlington Mills . . P. O. Box 200, Essex St. Station
. . . . . 78 Chauncy St., Boston, Mass. . . . Apr. 27, 1899.
William Henry Hobbs . Supt. The Red Cross Cotton Mills New Brunswick, N. J. . Apr. 24, 1902.
Clark W. Holcomb . . Treas. Old Colony Mills, Taunton, ...
. . . . . P. O. Box 5, New Bedford, Mass. . Sept. 21, 1905.
Charles M. Holmes . . Agt. Manomet Mills, ...
. . . . . Box 96, New Bedford, Mass. . Apr. 27, 1899.
Gideon F. Holmes . . Treas. and Gen. Mgr. Plymouth Cor- . . . . . .
. . . . . dage Co. . . . . No. Plymouth, Mass. . Oct. 30, 1889.
George W. Holt . . . Agt. Monohansett Manufg. Co. . . Putnam, Conn. . . . Oct. 29, 1879.
John H. Holt . . . . Supt. Luther Mfg. Co. . . . . Fall River, Mass. . . Apr. 23, 1903.

Digitized by Google

Walter L. Holt . . . . Prest. Holt-Morgan Mills . . . . . Fayetteville, N. C. . . Oct. 18, 1900.
William P. Holt . . . . . West Warren, Mass. Oct. 25, 1893.
Robert P. Hooper . . Treas. Hooper Sons Mfg. Co., ... 509 Arch St., Philadelphia, Pa. . . . Sept. 21, 1905.
Wm. E. Hooper . . . Mgr. Woodberry Div. of Mt. Vernon Woodberry Co. . . . . 15 East Franklin St., Baltimore, Md. . . . Apr. 23, 1903.
H. B. Hopson . . . . Supt. Spool Cotton Dept., Bibb Mfg. Co. . . . . Box 98, Macon, Ga. . . . . Apr. 28, 1904.
Amos G. Hosmer . . . Mech. Supt. Lancaster Mills . . . . . 40 Chestnut St., Clinton, Mass. . . . Apr. 25, 1907.
Edward W. Houghton Supt. Globe Mill, . . Manville Co., Woonsocket, R. I. . Apr. 24, 1902.
Henry S. Houghton, Jr. Supt. Anchor Webbing Co. . . . . Woonsocket, R. I. . Apr. 24, 1895.
W. C. Houston . . . . Prest. Hope Mills Manufg. Co. . . . . 333 Drexel Building, Philadelphia, Pa. . . Apr. 28, 1897.
Elisha H. Howard . . Agt. Slater Cotton Co., 49 Church St., Pawtucket, R. I. . . Apr. 25, 1907.
Henry S. Howe . . . . Dry Goods Commission . . . . . 89 Franklin St., Boston, Mass. . . . Oct. 31, 1877.
Walter J. Howland . . Supt. Hebron Mfg. Co., Hebron, Mills, Hebronville, Mass. . Apr. 25, 1907.
Albert C. Hoy . . . . Grosvenor Dale Co., . P. O. Box 872, Providence, R. I. . . Apr. 27, 1898.
Charles W. Hubbard . Treas. and Sec. Ludlow Mfg. Associates . . . . . Shawmut Bank Bldg., Boston, Mass. . . . Apr. 25, 1901.
W. S. Hume, ... Supt. Hamilton Woolen Co. . . . . Amesbury, Mass. . . Apr. 25, 1907.
Otis L. Humphrey . . Harding, Whitman & Co., 78 Chauncy St., Boston, Mass. Apr. 25, 1901.
Arthur W. Hunking . . Engineer-in-charge, Stone & Webster, St. Croix Falls, Wis. . Apr. 24, 1895.

D. Edwin Irving . . . Treas. The Irving & Leiper Mfg. Co., Chester, Pa. . . . . Oct. 28, 1897.

P. T. Jackson, Jr. . . . Treas. Lowell Weaving Co. . . . . Lowell, Mass. . . . Sept. 21, 1905.
Joseph B. Jamieson . . Prest. Holmes Knitting Co. . . . . 77 Summer St., Room 80, Boston, Mass. . . . Oct. 2, 1902.
Earl S. Jenckes . . . . Supt. Paul Whitin Mfg. Co. . . . . Northbridge, Mass. . Apr. 27, 1905.
Frederick L. Jenckes . Agt. Jenckes Spinning Co. . . . . Pawtucket, R. I. . . Apr. 25, 1907.
J. E. Jenckes . . . . . Treas. E. Jenckes Manufg. Co. & E. Jenckes Spinning Co. . . . . Pawtucket, R. I. . . Apr. 24, 1895.
Edward B. Jennings . . Treas. Samoset Co. & Agt. Allen Ptg. Co., Providence, R. I . . . . . Valley Falls, R. I. . . Sept. 29, 1898.
W. H. Jillson . . . . Mfr. Cotton Yarns . . . . . Westfield, Mass. . . Apr. 26, 1906.
Leonard Johnson . . . Supt. Page Mfg. Co. . . 9 Allen St., New Bedford, Mass. . Oct. 1, 1903.
David S. Johnston . . Gen. Supt. Harmony Mills . . . . Cohoes, N. Y. . . . Oct. 28, 1891.
Gordon A. Johnstone . Agt. Danielson Cotton Co. . . . . Danielson, Conn. . . Apr. 23, 1903.
W. T. Jordan . . . . . Atlanta, Ga. . . . . Oct. 25, 1895.

Nelson D. Keables . . Mech. Supt. Mass. Cotton Mills . . . . . 14 Hoyt Ave., Lowell, Mass. . . . Apr. 26, 1906.

Digitized by Google

W. E. Keach . . . . . Supt. Grant Yarn Co., 21 Burnap St., Fitchburg, Mass. . . Oct. 26, 1892.
Roland R. Kelly . . . Supt. Williamstown Manufg. Co. . Williamstown Sta., Mass. Nov. 30, 1881.
James B. Kerr . . . . Agt. American Thread Co., Kerr Mills, Fall River, Mass. . . Apr. 25, 1907.
Nathaniel B. Kerr . . . Treas. Butler Mill . . . . . New Bedford, Mass. . Oct. 26, 1892.
Harry W. Kimball . . Supt. Mt. Vernon Mills . Hampden, Baltimore, Md. . . . Oct. 25, 1895.
William N. Kimball . . Supt. Social and Nourse Mills, Manville Co. . . . . Woonsocket, R. I. . . Apr. 24, 1902.
Robert F. Kineavy . . Supt. Arasapha Mfg. Co. . . . . Chester, Pa. . . . . Sept. 21, 1905.
Alexander King, Jr. . . Asst. Supt. American Thread Co. . . Westerly, R. I. . . Apr. 27, 1905.
Emil Kipper . . . . . Prest. Blackington Mfg. Co. of Blackington . . . . . Adams, Mass. . . . Apr. 24, 1902.
John T. Kirk . . . . . Supt. Weaving Slater Cotton Co., Box 697 . . . . . Pawtucket, R. I. . . Apr. 27, 1905.
Albert F. Knight . . . Mfr. Fine White Cotton Goods and Yarns . . . . . 1149 Elmwood Ave. Box 835, Providence, R. I. . . Oct. 27, 1886.
Jesse A. Knight . . . . Asst. Treas. and Supt. Argo Mills Co. Gloucester City, N. J. Oct. 26, 1892.
Stephen A. Knight . . Prest. Hebron Manufg. Co., Box 820, Providence, R. I. . . Oct. 21, 1868.
Walter B. Knight . . . Supt. The Windham Mfg. Co. . . . Willimantic, Conn. . Apr. 24, 1889.
Webster Knight . . . B. B. & R. Knight's Mills . . . . . 3 Washington Row, Providence, R. I. . . Oct. 31, 1888.
John Kniveton . . . . Instr. Weaving and Warp Preparation, ... Bradford Durfee Textile School, Fall River, Mass., . . Sept. 22, 1904.
John W. Knowles . . . Treas. Page Mfg. Co. . . . . New Bedford, Mass. . Sept. 13, 1906.

Fred Lacey . . . . . Supt. Boott Mills . . . . . Lowell, Mass. . . . Apr. 24, 1895.
Elliott Cowdin Lambert, Supt. Amoskeag Manufg. Co. . . . Manchester, N. H. . Oct. 25, 1895.
William T. Lang . . . Agt. Brookside Mills . . . . . Knoxville, Tenn. . . Apr. 28, 1897.
Walter H. Langshaw . { Agt. and Prest. Dartmouth Mfg. Corp., Prest. Bristol Mfg. Corp. } New Bedford, Mass. . Apr. 29, 1896.
Leonard C. Lapham . Treas. Nonquitt Spinning Co. . . . New Bedford, Mass. Apr. 25, 1907.
Harold Lawton . . . . V. P. & Gen. Mgr. The Lawton Mills, Corp. . . . . Plainfield, Conn. . . Oct. 27, 1886.
John Edward Lawton . Governing Director American Thread Co., ... Matlock, Derbyshire, England . Apr. 25, 1901.
Berry Laycock . . . . Supt. Franklin Mills Corp. Unionville, Franklin, Mass. . . Apr. 25, 1907.
Calvin H. Lee . . . . Supt. Readville Cotton Mills . . . Hyde Park, Mass. . . Apr. 24, 1902.
William A. Lehan . . . Supt. Burgess Mills . . . . . 133 Mineral Spring Ave., Pawtucket, R. I. . . Apr. 25, 1907.
Evan Arthur Leigh . . Textile Machinery 232 Summer St., Boston, Mass. . . . . Oct. 29, 1890.
J. Colby Lewis . . . . Agt. Salmon Falls Mfg. Co. . . . . Salmon Falls, N. H. . Oct. 26, 1892.
Charles F. Libby . . . Supt. Shaw Stocking Co. . . . . Lowell, Mass. . . . Apr. 24, 1902.
Leontine Lincoln . . . Prest. Seaconnet Mills . . . . . Fall River, Mass. . . Apr. 28, 1897.
B. F. G. Linnell . . . Commission Merchant, Yarns, Threads and Twines . . . . . 37 Summit St., P. O. Box 645, Central Falls, R. I. . . Oct. 28, 1897.
Henry F. Lippitt . . . Gen. Mgr. Manville Cos., P.O. Box 139, Providence, R. I. . . Apr. 27, 1881.

Digitized by Google

L. A. Lockwood	Prest. Crefeld Waste & Batting. Co. & The L. A. Lockwood Co.	Saylesville, R. I.	Sept. 21, 1905.
William H. Loftus	Supt. Clark Thread Co.	Newark, N. J.	Oct. 28, 1897.
Oliver N. Long	Long Bros. Co.	3d and Ontario Sts., Philadelphia, Pa.	Sept. 13, 1906.
Harry D. Lord	Selling Agt. Saco and Pettee Machine Shops	244 Main St., Biddeford, Me.	Apr. 27, 1905.
Hartley L. Lord	Gen. Mgr. Union-Buffalo Mills Co.	Union, S. C.	Apr. 26, 1906.
John T. Lord,	Supt. Pacific (Lower) Mills	Lawrence, Mass.	Apr. 28, 1904.
Robert W. Lord	Prest. & Treas. R. W. Lord & Co.	Kennebunk, Me.	Oct. 20, 1869.
Ernest Lovering	Agt. Lyman Mills	Holyoke, Mass.	Apr. 25, 1888.
Henry M. Lovering	Asst. Treas. Whittenton Manufg. Co.	Taunton, Mass.	Oct. 27, 1880.
William C. Lovering	Prest. Whittenton Manufg. Co.	50 State St., Boston, Mass.	Oct. 25, 1876.
William M. Lovering		Taunton, Mass.	Sept. 27, 1894.
Arthur H. Lowe	Treas. Parkhill Mfg. Co., Treas. Wm. Lowe Mfg. Co. Huntsville, Ala.	Fitchburg, Mass.	Oct. 30, 1889.
David Lowe	Supt. Parkhill Manufg. Co.	Fitchburg, Mass.	Apr. 24, 1895.
Russell B. Lowe	Prest. Parkhill Mfg. Co.	Fitchburg, Mass.	Apr. 25, 1907.
Charles B. Luther	Treas. Luther Mfg. Co.	240 Hartwell St., P. O. Box 57, Fall River, Mass.	Sept. 22, 1904,
William L. Lyall	Treas. Brighton Mills	Passaic, N. J.	Oct. 26, 1892.
Herbert Lyman		39 Beacon St., P. O. Box 1717, Boston, Mass.	Oct. 25, 1895.
Ronald T. Lyman	Treas. Boston Mfg. Co.	P. O. Box 1717, Boston, Mass.	Oct. 1, 1903.
Alvin S. Lyon	Agt. Wood Worsted Mill	Lawrence, Mass.	Apr. 26, 1882.
C. W. Macara	Care Henry Bannerman & Sons, Ltd.,	33 York St., Manchester, England.	Apr. 25, 1907.
W. H. Macdonald	Asst. Supt. St. Croix Mill, Canadian Col'd Cotton Mill Co.,	Milltown, New Brunswick	Apr. 26, 1906.
Charles L. Macomber	Prest. Winthrop Cotton Yarn Co.	Taunton, Mass.	Apr. 24, 1895.
Frederick B. Macy,	Treas. Soule Mills,	New Bedford, Mass.	Apr. 25, 1901.
Amos G. Maddox	Supt. Linwood Cotton Mill	Linwood, Mass.	Oct. 18, 1900.
Charles T. Main	M. E.	45 Milk St., Rms. 907, 911, Boston, Mass.	Oct. 28, 1885.
Alexander Makepeace	Supt. Richard Borden Mfg. Co.	Fall River, Mass.	Oct. 1, 1903.
Charles R. Makepeace	M. E. and Treas. United Lace and Braid Mfg. Co.	Box 973, Providence, R. I.	Apr. 30, 1890.
Vladimir Malinin, M. E.,	Prochoroff Three Hill Mfg. Co.	Presuja St., Moscow, Russia	Apr. 23, 1903.
J. D. Mallory	Supt. John M. Stone Cotton Mill	Starkville, Miss.	Apr. 27, 1905.
Fred B. Manley	Treas. Spencer Yarn Co.	Adamsdale, Mass.	Apr. 26, 1906.
Arthur B. Mann	J. H. Martin & Co.,	99 Franklin St., New York, N. Y.	Apr. 25, 1894.
Charles H. Manning	Supt. Amoskeag Manufg. Co.	Manchester, N. H.	Oct. 28, 1885.
Henry F. Mansfield	Gen. Supt. Utica Steam Cotton Mills and Mohawk Valley Cotton Mills	Utica, N. Y.	Apr. 30, 1890.
Paul J. Marrs	Treas. Henderson Cotton Mills	Henderson, Ky.	Oct. 28, 1897.

Digitized by Google

Henry D. Martin	Gen. Supt. Lancaster Mills	Clinton, Mass.	Apr. 28, 1897.
Arthur H. Mason	Treas. Davis Mills	Fall River, Mass.	Oct. 2, 1902.
Frederick R. Mason	Prest. and Treas. The Robert D. Mason Co.	Pawtucket, R. I.	Sept. 21, 1905.
Philip A. Mathewson	Supt. King Philip Mills	Box 607, Fall River, Mass.	Apr. 24, 1895.
Scott Maxwell	Agt. Indian Head Mills of Ala.	Cordova, Ala.	Sept. 26, 1901.
Andrew W. McAllister		Natick, R. I.	Apr. 28, 1904.
Robert McArthur	Agt. Pepperell Mfg. Co.	Biddeford, Me.	Apr. 17, 1872.
Thos. McAuliffe	Supt. Stevens Mfg. Co.	Fall River, Mass.	Apr. 27, 1898.
Edward J. McCaughey	Sec'y Home Bleach & Dye Works	106 Spring St., Pawtucket, R. I.	Apr. 26, 1906.
Fred C. McDuffie	Treas. Everett Mills and York Mfg. Co., P. O. Box 2934	24 Milk St., Boston, Mass.	Oct. 25, 1882.
Robert P. McEwen	Supt. Lambeth Rope Corp.	64 Willis St., New Bedford, Mass.	Apr. 26, 1906.
John G. McFadden	Supt. Natick Mills	Natick, R. I.	Oct. 1, 1903.
David H. McKinley	Prop. Philadelphia Thread Co.	Hancock and Oxford Sts., Philadelphia, Pa.	Sept. 21, 1905.
James A. McLane	Supt. Davis Mills	Fall River, Mass.	Oct. 2, 1902.
John E. McLaughlin	Sec'y. Treas. and Mgr. La Tosca Yarn Mill	Utica, N. Y.	Apr. 25, 1907.
William G. McLoon		Clinton, Mass.	Apr. 27, 1892.
R. P. McLoughlin	Asst. Treas. and Asst. Mgr. La Tosca Yarn Mill	Utica, N. Y.	Sept. 13, 1906.
Robert G. McMeehan,	Agt. Uncasville Mfg. Co.	Uncasville, Conn.	Sept. 26, 1901.
William P. McMullan	Agt. Naumkeag Steam Cotton Co.	Salem, Mass.	Sept. 27, 1894.
Charles E. Meader	Agt. Lowell Bleachery	Lowell, Mass.	Apr. 25, 1907.
John Tempest Meats	Agt. Mason Machine Works	Taunton, Mass.	Apr. 27, 1887.
Robert B. Meikle	Supt. Lorraine Mfg. Co.	Westerly, R. I.	Apr. 23, 1903.
Henry P. Meikleham,	Agt. Mass. Mills in Georgia	Lindale, Floyd Co., Ga.	Apr. 26, 1900.
Joseph Mercer	Agt. and Treas. Willimantic Cotton Mills Co.	Willimantic, Conn.	Apr. 24, 1902.
Bernard F. Merriam	Treas. Cordaville Woolen Co.	So Framingham, Mass.	Apr. 25, 1907.
Joseph Merriam	Prest. Springfield Webbing Co.	Middletown, Conn.	Oct. 2, 1902.
Charles H. Merriman, Jr.	Manville Co., Board of Trade Bldg.,	Providence, R. I.	Apr. 24, 1895.
James G. Merriam, Jr.	Mgr. Standard Spinning Co.	Oswego, N. Y.	Sept. 21, 1905.
Walter C. Metcalf	Prest. Cordaville Woolen Co.	Westboro, Mass.	Apr. 25, 1907.
R. M. Miller, Jr.	Prest. & Treas. Elizabeth Mills	Charlotte, N. C.	Sept. 29, 1898.
Simon Miller	Member Firm Jacob Miller Sons & Co., Borich Mills	16th & Reed Sts., Philadelphia, Pa.	Apr. 26, 1906.
Albert D. Milliken	Supt. New England Cotton Yarn Co.,	237 Summer St., New Bedford, Mass.	Apr. 25, 1907.
Almon A. Milliken	Supt. The Jackson Co.	Nashua, N. H.	Sept. 21, 1905.
James I. Milliken	Agt. Everett Mills	Lawrence, Mass.	Oct. 26, 1892.
Roscoe S. Milliken	Agt. Nashua Mfg. Co.	Nashua, N. H.	Apr. 29, 1896.
David Milne	C. J. Milne & Sons	Washington Ave. & 10th and 11th Sts., Philadelphia, Pa.	Apr. 28, 1897.

Digitized by Google

William A. Mitchell . . Mfg. Supt. Mass. Cotton Mills . . . . . P. O. Box 1230, Lowell, Mass. . . Apr. 25, 1907.
A. B. Mole . . . . . Gen. Mgr. Dominion Textile Co. Ltd. . . . . 210 Milton St., Montreal, P. Q. . . . Apr. 24, 1895.
Edward A. Mongeon . Supt. Lonsdale Mills . . . . . Lonsdale, R. I. . . . Apr. 24, 1895.
George M. Montgomery Vice Prest. The J. R. Montgomery Co. Windsor Locks, Conn. Sept. 22, 1904.
J. R. Montgomery . . Prest. The J. R. Montgomery Co. . Windsor Locks, Conn. Sept. 29, 1898.
George A. Moody . . . . . 206 Fountain St., Pawtucket, R. I. . . Apr. 27, 1899.
Fred W. Moore . . . Agt. Cordis Mills . . P. O. Box 582, Millbury, Mass. . . . Apr. 27, 1892.
William F. Morgan . . Treas. & Gen. Mgr. Fitchburg Duck Mills . . . . . Fitchburg, Mass. . . Apr. 26, 1906.
George B. Morison . . Prest. Ballou Yarn Co., 77 Summer St., Boston, Mass. . . . . Apr. 24, 1895.
Albert H. Morton . . . Supt. Lowell Machine Shop . . . . Lowell, Mass. . . . Oct. 28, 1891.
E. P. Morton, ... Agt. Stevens Linen Works . . . . Webster, Mass. . . . Sept. 26, 1901.
Harold Mowry . . . . Mgr. Sterling Branch U. S. Finishing Co. . . . . Sterling, Conn. . . . Apr. 27, 1905.
Farquharson J. Muir . Cone Export & Commission Co. . . Greensboro, N. C. . . Apr. 27, 1892.
James P. Murray . . . Prest. Toronto Carpet Mfg. Co. . . . . 445 Euclid Ave., Toronto, Canada . . Apr. 25, 1907.
William Myers . . . . Lecturer in Textiles, Sunny Bank, ... Stone Edge, Marple, Cheshire, England . . . . . Sept. 22, 1904.

John Neild . . . . . Agt. Grinnell Mfg. Corp. . . . . New Bedford, Mass. . Apr. 25, 1901.
Will Nelson . . . . . Head Instructor of Weaving, Lowell Textile School . . . . . Lowell, Mass. . . . Apr. 23, 1903.
Roscius C. Newell . . . Supt. Palmer Mill, Otis Co. . . . . Three Rivers, Mass. . Oct. 25, 1895.
H. W. Nichols . . . . Supt. New Bedford Textile School . New Bedford, Mass. . Sept. 22, 1904.
William A. Nichols . . Mill Supt. . . . . 120 Pine St., Fall River, Mass. . . Apr. 26, 1906.
William G. Nichols . . Gen. Res. Agt. China, Webster & Pembroke Mills . . . . . Suncook, N. H. . . . Oct. 25, 1893.
Theodore O. Nicholson Treas. Millen Mills, 65 Franklin St., Boston, Mass. . . . . Apr. 25, 1907.
Albert W. Noone . . . Prop. & Mgr. Jos. Noone's Son's Co. Peterboro, N. H. . . Sept. 26, 1901.
Franklin Nourse . . . Agt. Lawrence Manufg. Co. . . . . Lowell, Mass. . . . Apr. 24, 1878.

S. Odenheimer . . . . Textile Mills Corp. . . . . New Orleans, La. . . Oct. 25, 1893.
Charles K. Oliver . . . Prest. U. S. Duck Corporation . . Baltimore, Md. . . . Sept. 27, 1894.
Louis Atwell Olney . . Prof. Chemistry & Dyeing, Lowell Textile School . . . . . Lowell, Mass. . . . Apr. 26, 1906.
William B. Orr, ... Treas. Forestdale Mfg. Co. . . . . Forestdale, R. I. . . Apr. 28, 1904.
Henry Osgood, ... 6 Monroe St., P. O. Box 204, Salem, Mass. . . . . Apr. 25, 1901.
Frederick Ott . . . . Supt. Lehigh Valley Silk Mills . . . South Bethlehem, Pa. Apr. 23, 1903.
Herbert W. Owen . . Supt. Cocheco Mfg. Co. . . . . Dover, N. H. . . . . Oct. 5, 1899.

Digitized by Google

Logan Owen . . . . Supt. Mill No. 1, Bibb Mfg. Co., . . Macon, Ga. . . . . Apr. 28, 1904.
Oscar L. Owen . . . . Mech. and Mill Eng. Whitin Machine Works . . . . . P. O. Box 168, Whitinsville, Mass. . Apr. 25, 1894.

Elmer E. Page . . . . Agt. York Manufacturing. Co. . . . Saco, Me. . . . . Apr. 27, 1892.
Calvin D. Paige . . . Treas. Central Mills . . . . . Southbridge, Mass. . Apr. 26, 1906.
Walter H. Paige . . . Supt. Wamsutta Mills Nos. 6 & 7 . . New Bedford, Mass. . Oct. 1, 1903.
O. B. Parker . . . . . 180 Main St., Pawtucket, R. I. . . Apr. 24, 1895.
Samuel L. Parker . . . Supt. Turners Falls Cotton Mills . . . . . Box 627, Turners Falls, Mass. . Apr. 29, 1896.
Winthrop Parker . . . Supt. Queen City Cotton Co. . . . . 54 Bay View St., Burlington, Vt. . . . Sept. 13, 1906.
Samuel F. Patterson . . Prest. and Treas. Thistle Mills Co. . Ilchester, Md. . . . Oct. 18, 1900.
Arthur H. Paul . . . . Asst. Supt. Boston Mfg. Co. . . . . Waltham, Mass. . . . Apr. 27, 1905.
John W. Pead . . . . . 1072 Bridge St., Lowell, Mass. . . . . Apr. 26, 1893.
James R. Pearce . . . Supt. Erwin Cotton Mills . . . . . Duke, N. C. . . . . Oct. 25, 1895.
William E. Peck . . . Agt. The Baltic Mills Co. . . . . Baltic, Conn. . . . . Apr. 26, 1906.
H. M. Peirce . . . . . Agt. Greenwich Bleachery . . . . East Greenwich, R. I. Apr. 26, 1906.
William C. Peirce . . . Pres. Elizabeth Mills . 564 Eddy St., Providence, R. I. . . Apr. 24, 1895.
William D. Pennell . . Agt. Hill Manufg. Co. . . . . Lewiston, Me. . . . Apr. 16, 1873.
Haven C. Perham . . . Treas. Kitson Machine Co. . . . . Lowell, Mass. . . . Apr. 30, 1879.
Charles W. Perkins . . Supt. Totokett Mfg. Co. . . . . Versailles, Conn. . . Sept. 21, 1905.
Hadley D. Perkins . . Mgr. Bellingham H'dk'f Mfg. Co., R. F. D. No. 1 . . . . . Woonsocket, R. I. . Apr. 28, 1904.
Thomas Perkins, Jr. . . Asst. Supt. Tremont & Suffolk Mills . . . . . 28 West Bower St., Lowell, Mass. . . . Apr. 25, 1907.
Charles M. Perry . . . Supt. Glenlyon Dye Works . . . . Saylesville, R. I. . . Apr. 25, 1907.
Aaron C. Phelps . . . Vice Prest. & Gen. Mgr. German-American Co. . . . . Spray, N. C. . . . . Apr. 26, 1906.
Henry C. Phillips . . . Asst. Gen. Supt. Harmony Mills . . Cohoes, N. Y. . . . Apr. 25, 1894.
Albert R. Pierce . . . Supt. Pierce Mfg. Corp. . . . . New Bedford, Mass. . Oct. 5, 1899.
Andrew G. Pierce, Jr. . Treas. Pierce Manufg. Corp. . . . . P. O. Box 34, New Bedford, Mass. . Apr. 24, 1895.
Victor E. Pihl . . . . Mech. Supt. Boott Mills, 869 Bridge St., Lowell, Mass. . . . Apr. 25, 1907.
Robert Place . . . . . Supt. Flint Mills, Fall River, Mass., Corr Mills, Taunton, Mass., ... 212 Weybosset St., Fall River, Mass. . . Apr. 26, 1906.
Charles H. Plummer . . Agt. Great Falls Manufg. Co., . . . Somersworth, N. H. Apr. 25, 1888.
Charles T. Plunkett . . Sec'y. Berkshire Cotton Mfg. Co. . Adams, Mass. . . . Apr. 28, 1897.
William B. Plunkett . . Treas. Berkshire Cotton Mfg. Co. and Greylock Mills . . . . . Adams, Mass. . . . Sept. 21, 1905.
William C. Plunkett . . Mgr. W. C. Plunkett & Sons . . . Adams, Mass. . . . Oct. 1, 1903.
Frank Porter, Jr. . . . . Webster, Mass. . . . Apr. 26, 1906.
Charles H. Potter, . . . Supt. Montreal Cotton Co., ... Valleyfield, P. Q., . . Apr. 25, 1901.
Joseph H. Potter, Jr. . Supt. Durfee Mills . . . . . Fall River, Mass. . . Apr. 27, 1899.
J. F. Powers . . . . . Supt. Spinning Mill . . . . . Middletown, Conn. . Oct. 5, 1899.

Digitized by Google

Lavater W. Powers . . Gen. Supt. New York Mills . . . . . .
. . . . . New York Mills, Oneida County, N. Y. Oct. 1, 1903.
Albert S. Pratt . . . . Agt. Edwards Mfg. Co. . . . . Augusta, Me. . . . . Apr. 27, 1905.
Herbert L. Pratt . . . Agt. Bates Manufg. Co. . . . . Lewiston, Me. . . . Oct. 27, 1875.
George E. Prest . . . 9 Russell St. . . . . Melrose, Mass. . . . Apr. 24, 1902.
John E. Prest . . . . 9 Russell St. . . . . Melrose, Mass. . . . Apr. 17, 1872.

F. J. Quinn . . . . . Agt. Hamilton Woolen Co. . . . . Amesbury, Mass. . . Apr. 26, 1906.

Theodore Ellis Ramsdell, Gen. Supt. Monument Mills . . . . Housatonic, Mass. . Apr. 23, 1903.
M. A. Rawlinson . . . Agt. Chicopee Mfg. Co. . . . . Chicopee Falls, Mass. Apr. 24, 1895.
Joseph G. Ray . . . . Treas. The Putman Mfg. Co. . . . Woonsocket, R. I. . . Sept. 13, 1906.
Charles O. Read . . . Mgr. Sayles' Bleacheries, and Treas. Glenlyon Dye Works
. . . . . 63 Summit St. Pawtucket, R. I. . . Sept. 21, 1905.
J. H. Reaney . . . . . Mgr. Royal Gem Mills Co. . . . . St. Johnsville, N. Y. . Apr. 25, 1907.
John F. Reardon . . . Supt. Millville Mfg. Co. . . . . Millville, N. J. . . . Apr. 26, 1900.
Robert Redford . . . . . Box 28, Lawrence, Mass. . . Apr. 26, 1882.
R. S. Reinhardt . . . . Prest. and Treas. Elm Grove Cotton Mills . . . . . .
. . . . . Lincolnton, N. C. . . Apr. 27, 1898.
T. H. Rennie . . . . . Supt. Graniteville Mfg. Co. . . . . Graniteville, S. C. . . Oct. 18, 1900.
Robert Reoch . . . . Gen. Mgr. Cranston Print Works Co. Phenix, R. I. . . . . Sept. 21, 1905.
Frederic W. Reynolds, Supt. Potomska Mills, Corp. . . Box 299, ...
. . . . . 53 Fourth St., New Bedford, Mass. . Apr. 26, 1900.
Hiram L. Reynolds . . Supt. Saunders Cotton Mills . . . . Saundersville, Mass. . Apr. 25, 1907.
Francis H. Rice . . . . Prest. Holbrook Mills . . . . . Millbury, Mass. . . . Apr. 28, 1880.
John Bion Richards . . Care Army and Navy Club . . . . New York City . . . Apr. 24, 1902.
Charles H. Richardson Agt. Lancaster Mills . . . . . Clinton, Mass. . . . Apr. 24, 1889.
Harry J. Ricketson . . Supt. Merchants' Mfg. Co. . . . . Fall River, Mass. . Apr. 28, 1904.
Walter Rigby . . . . Bibb Mfg. Co. . . 3163 First Ave., Columbus, Ga. . . . Apr. 26, 1900.
Charles E. Riley . . . C. E. Riley & Co. . . . . .
. . . . . 65 Franklin St., Box 2815, Boston, Mass. . . . Apr. 25, 1888.
Richard G. Riley . . . Supt. Davol Mills . . . . . Fall River, Mass. . . Apr. 25, 1907.
Benj. H. Roberts . . . General Mill Supplies 163 Grove St., Fall River, Mass. . . Apr. 26, 1900.
George W. Robertson . Supt. Dan River Cotton Mills . . . Danville, Va. . . . . Apr. 26, 1906.
Charles D. Robinson . Supt. Crompton Co. . . . . Crompton, R. I. . . . Sept. 27, 1894.
William H. Robinson . Supt. No. 3 Harmony Mill . . . . Cohoes, N. Y. . . . Apr. 24, 1902.
John J. Rooney . . . Asst. Supt. Tremont & Suffolk Mills . . . . . .
. . . . . 151 Cabot St., Lowell, Mass. . . . Apr. 27, 1905.
W. H. Rose . . . . . Sec'y & Treas. Richland, Granby and Olympia Cotton Mills
. . . . . Columbia, S. C. . . . Oct. 18, 1900.
Israel P. Rounds . . . Supt. Naushon Co., 20 Maynard St., Pawtucket, R. I. . . Apr. 26, 1906.
Henry Rowe . . . . . Supt. Elk Mountain Bleachery . . . Asheville, N. C. . . Apr. 28, 1904.
Lewis H. Russell . . . . . 16 Cambridge St., Rochester, N. Y. . . Apr. 27, 1905.

Digitized by Google

Alfred Sagar . . . . . Supt. Arlington Cotton Mills . . . . . .
. . . . . 6 Stevens St., Methuen, Mass. . . Apr. 24, 1902.
Edward H. Sanborn . . Vice Prest. Cold Spring Bleaching and Finishing Works .
. . . . . 305 Betz Bldg., Philadelphia, Pa. . . Oct. 18, 1900.
W. K. Sanborn . . . . Supt. R. W. Lord Co. . . . . West Kennebunk, Me., Apr. 25, 1907.
J. N. Sanderson . . Agt. Renfrew Mfg. Co., ... Adams, Mass. . . . Apr. 28, 1904.
Arnold B. Sanford . . Prest. Amer. Cotton Yarn Exchange . . . . . .
. . . . . 67 Chauncy St., Boston, Mass. . . . Oct. 25, 1882.
Pardon B. Sanford . . Supt. Utica Knitting Co. . . . . Utica, N. Y. . . . . Oct. 2, 1902.
J. Herbert Sawyer . . . . . 84 State St., Boston, Mass. . . . July 19, 1865.
Frank A. Sayles . . . Prop. Sayles Bleacheries, Prest. Lorraine Mfg. Co. . . .
. . . . . Pawtucket, R. I. . . Apr. 26, 1906.
Arnold Schaer . . . . Agt. Warren Manufg. Co. . . . . Warren, R. I. . . . Apr. 24, 1895.
Albert E. Schofield . . Treas. Delph Spinning Co. . . . . .
. . . . . Clearfield and C Sts., Philadelphia, Pa. . . Oct. 1, 1903.
Robert Schofield . . . Supt. N. E. Cotton Yarn Co., ...
. . . . . P. O. Box 380, New Bedford, Mass. Apr. 25, 1907.
Winfield S. Schuster . . V. P. Forestdale Mills . . . . . East Douglas, Mass. . Apr. 25, 1907.
Theodore C. Search . . Prest. Cold Spring Bleaching and Finishing Works . . .
. . . . . Yardley, Pa. . . . . Oct. 18, 1900.
Albion K. Searls . . . Supt. Yarn Dept., Oneita Knitting Mills . . . . . .
. . . . . 195 Elizabeth St., Utica, N. Y. . . . . Apr. 24, 1902.
Charles M. Sears . . . Supt. Monroe Cotton Mills . . . . Monroe, Ga. . . . . Apr. 27, 1898.
George H. Shapley . . Treas. Silver Lake Co., 78 Chauncy St. . . . . .
. . . . . Boston, Mass. . . . . Apr. 29, 1896.
Frank P. Sheldon . . . Mill Engineer and Architect, 49 Westminster St. . . . . .
. . . . . Industrial Trust Bldg. Providence, R. I. . . Apr. 25, 1894.
Thomas C. Sheldon . . . . . 8 School St., Fitchburg, Mass. . . Oct. 29, 1884.
Charles W. Shepard . . Mgr. Alton Mfg. Co. . . . . Alton, R. I. . . . . Sept. 21, 1905.
Willis S. Shepard . . . V. P. American Net and Twine Co. . . . . .
. . . . . 375 Atlantic Ave., Boston, Mass. . . . Apr. 29, 1896.
Edwin G. Shepardson . Supt. Kilburn Mill . . . . . New Bedford, Mass. Apr. 25, 1907.
William F. Sherman . . Broad Exchange Bldg. . . 88 Broad St., Boston, Mass. .
. . . . . Res. 128 Youle St., Melrose, Mass. . . Apr. 15, 1874.
Charles M. Shove . . . Treas. Granite Mills . . . Box 45, Fall River, Mass. . . Oct. 27, 1875.
W. Frank Shove . . . Treas. Pocasset Mfg. Co., Fall River Mfg. Co., ...
Fall River, Mass. and Windham Mfg. Co., Willimantic, Conn. . . . . .
. . . . . Fall River, Mass. . . Sept. 22, 1904.
Herbert H. Shumway . . . . . Taunton, Mass. . . . Apr. 26, 1893.
Francis H. Silsbee . . Supt. Cotton Dept. Pacific Mills . . Lawrence, Mass. . . Apr. 7, 1887.
Nathaniel G. Simonds . Treas. Naumkeag Steam Cotton Co., Salem, Mass. . . . . Apr. 27, 1898.
Louis Simpson . . . . Gen. Mgr. Montreal Cotton Co. . . Valleyfield, P. Q. . . . Apr. 24, 1895.
John Skinner . . . . Asst. Treas. West Boylston Mfg. Co., Easthampton, Mass. Apr. 26, 1906.
Abbott E. Slade . . . Treas. Laurel Lake Mills . . . . . .
. . . . . 863 High St., Fall River, Mass. . . Oct. 25, 1893.
Archer J. Smith . . . Treas. The American Mills Co. . . Waterbury, Conn. . Apr. 26, 1906.

Digitized by Google

Arthur T. Smith	Supt. Langley Manufg Co. / Supt. Aiken Manufg. Co.	Langley, S. C.	Oct. 25, 1895.
Charles S. Smith	Mgr. Smith Webbing Co.	Pawtucket, R. I.	Sept. 21, 1905.
James Herbert Smith	Supt. Quinebaug Co.	Danielson, Conn.	Apr. 27, 1898.
Joel Smith	1311 Woodlawn Ave.	Augusta, Ga.	Oct. 25, 1895.
J. C. Smith	Supt. Chace Mills	Fall River, Mass.	Oct. 28, 1897.
John William Smith	Gen. Mgr. T. I. Birken & Co.	Chester, Pa.	Sept. 21, 1905.
Robert A. Smith	Asst. Supt. Mass. Cotton Mills	P. O. Box 1230, Lowell, Mass.	Apr. 25, 1907.
Stephen E. Smith	Instr. Cotton Spinning, Lowell Textile School,	Lowell, Mass.	Apr. 27, 1905.
Thomas Henry Smith	Jamestown Cotton Mill	Jamestown, N. Y.	Apr. 30, 1884.
W. H. Smith	Supt. American Textile Co.	Pawtucket, R. I.	Sept. 21, 1905.
Rufus A. Soule	Prest. Soule Mill & City Mfg. Corp.	New Bedford, Mass.	Apr. 28, 1904.
Rufus A. Soule, Jr.	Treas. Taber Mill	New Bedford, Mass.	Apr. 26, 1906.
William S. Southworth	Agt. Mass. Cotton Mills	Box 1230, Lowell, Mass.	Oct. 31, 1888.
Antonio Spencer	Prest. Spencer Yarn Co.	337 Butler Exchange, Providence, R. I.	Sept. 21, 1905.
Wilton H. Spencer	Textile Manuf.,	7 Exchange Pl., Providence, R. I.	Apr. 27, 1898.
George E. Spofford	Supt. Blackstone Mfg. Co.	Blackstone, Mass.	Apr. 29, 1896.
Alban Spooner	Prest. Beverly Underwear Co.	Beverly, N. J.	Sept. 21, 1905.
Henry B. Sprague	Treas. Boston Woven Hose and Rubber Co.	Lynn, Mass.	Oct. 5, 1899.
Leroy Springs	Prest. Lancaster Cotton Mills	Lancaster, S. C.	Oct. 25, 1895.
George R. Stearns	Prest. and Treas. Riverside Mills	Augusta, Ga.	Apr. 30, 1890.
Willard W. Stearns	Supt. Nos. 1 & 3 Farr Alpaca Co.	224 Pine St., Holyoke, Mass.	Sept. 13, 1906.
Dexter Stevens	Supt. Yarn Mills, Lancaster Mills	Lancaster, Mass.	Apr. 25, 1907.
John A. Stevens	Chief Engineer, Merrimack Mfg. Co.	78 Hanks St., Lowell, Mass.	Apr. 25, 1907.
T. B. Stevenson	Supt. Manchaug Co.	Manchaug, Mass.	Apr. 26, 1900.
William M. Stevenson	Supt. Hodges Fibre Carpet Co.	Indian Orchard, Mass.	Apr. 25, 1907.
Robert Stewart	Asst. Supt. Lonsdale Co.	Ashton, R. I.	Apr. 27, 1899.
Samuel Stewart	Supt. Boston Duck Co.	Bondsville, Mass.	Apr. 23, 1903.
William J. Stewart	Supt. S. Slater & Sons, Inc.	Webster, Mass.	Apr. 23, 1903.
Walter F. Stiles	Treas. Orswell Mills	Fitchburg, Mass.	Oct. 25, 1895.
O. W. Stites	Supt. Louisville Cot. Mills Co.	Louisville, Ky.	Oct. 25, 1895.
Henry W. Stone	Supt. Holliston Mills, 296 Walpole St.,	Norwood, Mass.	Apr. 25, 1907.
Thomas Stone	Supt. Taber Mills	New Bedford, Mass.	Apr. 25, 1907.
B. L. Stowe	Prest. Eureka Fire Hose Co.	Wilkinson and Arlington Aves., Jersey City, N. J.	Sept. 26, 1901.
Herman F. Straw	Agt. Amoskeag Manufg. Co. & Manchester Mills.	Manchester, N. H.	Oct. 28, 1885.
John B. Strongman	Treas. Gosnold Mills Co.	New Bedford, Mass.	Apr. 25, 1907.
John Sullivan	Care C. E. Riley & Co.,	65 Franklin St. Boston, Mass.	Apr. 27, 1899.

Digitized by Google

Timothy Sullivan . . . Supt. Stafford Mills . . . . . Fall River, Mass. . . Apr. 27, 1899.
Walter H. Summersby . Agt. Atlantic Cotton Mills . . . . Lawrence, Mass. . . Oct. 25, 1893.
Paul E. Sutro . . . . E. Sutro & Son . . . . . .
. . . . . Thomas & Clearfield Sts., Philadelphia, Pa. . . Sept. 13, 1906.
James O. Sweet . . . . Agt. and Treas. Ashland Cotton Co. Jewett City, Conn. . Apr. 28, 1886.

Frederic Taber . . . . Prest. Taber Mill . . . . . New Bedford, Mass. Apr. 26, 1906.
William C. Taber . . . Treas. Whitman Mills and Prest. Beacon Mfg. Co. . . . .
. . . . . New Bedford, Mass. Sept. 21, 1905.
Charles A. Tabor . . . Supt. Thorndike Co. . . . . Thorndike, Mass. . . Apr. 27, 1905.
Robert W. Taft . . . . Treas. Coventry Co. and Bernon Mills . . . . . .
. . . . . Box 1144, Providence, R. I. . . Sept. 27, 1894.
John Lincoln Tattersall, Director Robert Hyde Buckley & Sons, Ltd. . . . . .
. . . . . 69 Royal Exchange, Manchester, Eng. . . Apr. 25, 1907.
James W. Taylor . . . Care of Troy Knitting Co. . . . . Troy, N. Y. . . . . Oct. 26, 1892.
Samuel Taylor . . . . Supt. Soule Mill . . . . . New Bedford, Mass. . Oct. 1, 1903.
W. Marshall Taylor . . Agt. Indian Orchard Flax Co. . . . . .
. . . . . North Brookfield, Mass. . . Sept. 22, 1896.
Edward Thayer . . . . Sec'y Lebanon Mill Co. . . . . Pawtucket, R. I. . . Sept. 21, 1905.
S. Willard Thayer . . . Treas. Dexter Yarn Co. . . . . Pawtucket, R. I. . . Sept. 26, 1901.
Berton A. Thissell . . . . . 314 Ninth St., N. W., Washington, D. C. . Oct. 1, 1903.
Earl A. Thissell . . . . Treas. Lowell Hosiery Co. . . . . Lowell, Mass. . . . Oct. 30, 1878.
Ariel C. Thomas . . . Agt. Boott Cotton Mills . . . . . .
. . . . . 62 Mt. Vernon St., Lowell, Mass. . . . Oct. 31, 1888.
Charles E. Thomas . . Supt. . . . . Pontiac, R. I. . . . . Oct. 31, 1883.
Edward W. Thomas . . Gen. Mgr. Consolidated Cotton Duck Co. . . . . .
. . . . . 809 Continental Trust Bldg., Baltimore, Md. . . . Apr. 30, 1884.
James O. Thompson, Jr. Supt. Wampanoag Mills . . . . . Fall River, Mass. . . Oct. 18, 1900.
Charles R. Thomson . Supt. Renfrew Mfg. Co. . . . . Adams, Mass. . . . Apr. 27, 1905.
James Thomson . . . Asst. Mgr. Dwight Mfg. Co. . . . . .
. . . . . 53 State St., Boston, Mass. . . . . Apr. 25, 1907.
Ralph E. Thomson . . Supt. Parkhill Manufg. Co., Mill C. Fitchburg, Mass. . . Apr. 25, 1894.
T. W. Tillar . . . . . Treas. The Ashby Cotton Mill Co., Inc. Emporia, Va. . . . Sept. 21, 1905.
R. Irving Tobey . . . . . Lonsdale, R. I. . . . Oct. 2, 1902.
W. O. Todd . . . . . Sec'y. and Treas. Lawton Spinning Co. Box 1125, ...
. . . . . 621 Banigan Building, Providence, R. I. . . Oct. 18, 1900.
James P. Tolman . . . Prest. Samson Cordage Works . . . . . .
. . . . . 88 Broad St., Boston, Mass. . . . Oct. 29, 1890.
Daniel A. Tompkins . Prest. and Eng. D. A. Tompkins Co. Charlotte, N. C. . . . Oct. 25, 1895.
M. J. Toohey . . . . Mfr. Rope, Twine and Banding . . . . . .
. . . . . 809 Stafford Rd., Fall River, Mass. . . Oct. 2, 1902.
George W. Towne . . . Mgr. Bibb Mfg. Co. Columbus Mill Columbus, Ga. . . . Oct. 26, 1892.
Edward B. Townsend . Treas. Warwick Mills . . . . . .
. . . . . 27 Kilby St., Boston, Mass. . . . Apr. 25, 1901.

Digitized by Google

George M. Traber . . Mgr. The Perry Knitting Co. . . . Perry, N. Y. . . . . Sept. 13, 1906.
D. Irving Trainer . . . Agt. Lincoln Mfg. Co. . . . . Chester, Pa. . . . . Apr. 23, 1903.
Robert B. Treat . . . . Prest. and Treas. Manufacturers Fuel Co. of Rhode Island .
. . . . . 1032 Banigan Bldg., Providence, R. I. . . Sept. 27, 1894.
W. S. Trickett . . . . Supt. Attawaugan Co. . . . . Montville, Conn. . . Sept. 21, 1905.
C. H. Truesdell . . . . Supt. Attawaugan Co. . . . . Killingly, Conn. . . Oct. 29, 1884.
Oscar B. Truesdell . . . . . 18 Washington Terrace, Newtonville, Mass. . Oct. 15, 1873.
Frank S. Tucker . . . Salesman, Westinghouse Elec. & Mfg. Co. . . . . .
. . . . . 507 Trust Bldg., Charlotte, N. C. . . . Apr. 26, 1906.
George E. Tucker . . . Agt. Otis Co. . . . . Ware, Mass. . . . . Oct. 25, 1895.
Philip S. Tuley . . . Prest. and Treas. Louisville Cotton Mills Co. . . . . .
. . . . . Goss Ave. and McHenry St., Louisville, Ky. . . . Oct. 18, 1900.
Harry Tunstall . . . . Supt. Wm. Clark Mills American Thread Co. . . . . .
. . . . . Westerly, R. I. . . . Sept. 21, 1905.
George W. Turner . . Supt. Argo Mills Co. . . . . Gloucester City, N. J. Apr. 26, 1900.
William L. Turner . . Prest. North American Lace Co. . . . . .
. . . . . Eighth and Allegheny Ave., Philadelphia, Pa. . . Sept. 21, 1905.
William D. Twiss . . . Supt. Everett Mills . . . . . Lawrence, Mass. . . April 29, 1896.

Fenwick Umpleby . . Instr. Lowell Textile School . . . . Lowell, Mass. . . . Apr. 27, 1905.
Fred Unger . . . . . 48 Central St., Providence, R. I. . . Apr. 26, 1906.
Frederick A. Upham . Asst. Supt., Palmer Mill of the Otis Co. Three Rivers, Mass. . Sept. 13, 1906.
Charles T. Upton . . . . . 63 Mt. Vernon St., Lowell, Mass. . . . Apr. 28, 1897.

George A. Vaughan . . Supt. The Putnam Manufg. Co. . . Putnam, Conn. . . . Sept. 22, 1896.
William P. Vaughan . Agt. Putnam Manufacturing Co. . . . . .
. . . . . 1041 Banigan Building, Providence, R. I. . . Sept. 29, 1898.
Frank P. Vogl . . . . Agt. Monadnock Mills . . . . . Claremont, N. H. . . Sept. 27, 1894.

Jude C. Wadleigh . . . Agt. Merrimack Mfg. Co. . . . . Lowell, Mass. . . . Oct. 26, 1892.
Herbert E. Walmsley . Agt. Wamsutta Mills . . . . . New Bedford, Mass. . Oct. 29, 1890.
Robinson Walmsley . . Supt. Tecumseh Mills, P. O. Box 246, Fall River, Mass. . . Apr. 27, 1899.
Frederick T. Walsh . . Mgr. Thomas Leyland & Co., Dyestuffs, etc. . . . . .
. . . . . 195 Nesmith St., Lowell, Mass. . . . Apr. 28, 1897.
Joseph Wasserman . . Prest. Philadelphia Tapestry Mills, ...
. . . . . Allegheny Ave. and Front St. Philadelphia, Pa. . . Apr. 26, 1906.
Frederick E. Waterman Treas. Stafford Mills & Cornell Mills, Fall River, Mass. . . Sept. 22, 1904.
Joseph Watters . . . . Supt. Osborn Mills . . . . . Fall River, Mass. . . Oct. 15, 1873.
F. E. Wattles . . . . Agt. Boscawen Mills . . . . . Penacook, N. H. . . Oct. 5, 1899.
Ridley Watts . . . . . Commission Merchant Grinnell, Willis & Co. . . . . .
. . . . . 44 Leonard St., New York City . . . Apr. 25, 1907.

Digitized by Google

Wm. T. Westerman . . Mgr. Ontario Spinning Co. . . . . .
. . . . . 1729 Philip St., Philadelphia, Pa. . . Oct. 1, 1903.
W. B. Smith Whaley . Mechanical & Mill Engineer, ...
. . . . . 1012 Tremont Bldg., Boston, Mass. . . . Apr. 24, 1895.
Walter Whipple . . . Asst. Supt. Nashua Mfg. Co. . . . Nashua, N. H. . . . Sept. 13, 1906.
Channing Whitaker . . Infringement and Patentability of Inventions . . . . . .
. . . . . Lowell Machine Shop . . . . . Lowell, Mass. . . . Oct. 15, 1873.
James L. Whitaker . . Mgr. William Whitaker & Sons . . . . . .
308 Mariners and Merchants Bldg., Third and Chestnut Sts., Philadelphia, Pa. . . Sept. 21, 1905.
A. Tenny White . . . Supt. Manville Co. . . . . Manville, R. I. . . . Oct. 27, 1887.
Alphonso F. White . . Supt. Forestdale Mfg. Co., ... Forestdale, R. I. . . Apr. 24, 1902.
W. T. Whitehead . . . Mgr. The Mount Royal Spinning Co., Ltd., ...
. . . . . Montreal P. Q., Canada, Apr. 26, 1906.
Arthur F. Whitin . . . Prest. Saunders Cotton Mills . . . Whitinsville, Mass. . Apr. 24, 1895.
Fred B. Whitin . . . . Agt. Uxbridge Cotton Mills . . . . North Uxbridge, Mass., Apr. 28, 1897.
Henry T. Whitin . . . Treas. Paul Whitin Manufg. Co. . . Northbridge, Mass. . Apr. 25, 1877.
James Earle Whitin . . Treas. Uxbridge Cotton Mills . . . North Uxbridge, Mass., Apr. 23, 1903.
Paul Whitin . . . . . Asst. Treas. Paul Whitin Mfg. Co. . Northbridge, Mass. . Oct. 1, 1903.
Clarence Whitman . . Treas. Wilkesbarre Lace Mfg. Co. . . . . .
. . . . . 39–41 Leonard St., New York City . . . Apr. 26, 1906.
Harold C. Whitman . . Treas. Esmond Mills, 39 Leonard St., New York City . . . Apr. 25, 1907.
William Whitman . . Prest. Arlington Mills, 78 Chauncy St. . . . . .
. . . . . P. O. Box 100, Essex St. Station, Boston, Mass. . . . . Apr. 25, 1901.
William S. Whitney . . Supervising Engineer, American Woolen Co. . . . . .
. . . . . Lawrence, Mass. . . Apr. 24, 1878.
Arthur Whittam . . . N. Y. Representative James E. Mitchell Co. . . . . .
. . . . . 73 Leonard St., New York, N. Y. . . Apr. 27, 1898.
George F. Whitten . . . . . Manchester, N. H. . Oct. 26, 1892.
John H. Whitten . . . Agt. Stark Mills . . . . . Manchester, N. H. . Apr. 27, 1898.
W. R. B. Whittier . . Treas. Whittier Mills . . Chattahoochee, Fulton Co., Ga. . Oct. 18, 1900.
George A. Wies . . . . Treas. Eureka Fire Hose Co. . . . . .
. . . . . 13 Barclay St., New York City . . . Apr. 24, 1902.
R. W. Wight . . . . Asst. Treas. Indian Orchard Co. . . . . .
. . . . . P. O. Box 13, Indian Orchard, Mass., Apr. 28, 1904.
Edward B. Wilbur . . Vice Prest. & Supt. Mollohon Mfg. Co. Newberry, S. C. . . . Oct. 30, 1889.
Benjamin Wilcox . . . Treas. City Mfg. Co. . . . . New Bedford, Mass. . Apr. 26, 1900.
John B. Wild . . . . Prest. Oneita Knitting Mills . . . . . .
. . . . . 842 Bleecker St., Utica, N. Y. . . . . Apr. 26, 1900.
E. Wilkinson, Jr. . . . Member Firm of E. Wilkinson & Son . . . . . .
. . . . . Amber and Adams Sts., Philadelphia, Pa. . . Sept. 13, 1906.
Eben C. Willey . . . . Supt. Barnaby Mfg. Co. . . . . .
. . . . . 110 June St., Fall River, Mass. . . Apr. 29, 1896.
Eugene F. Willey . . . Supt. Globe Yarn Mills . . . . . Fall River, Mass. . . Sept. 13, 1906.
Franklin D. Williams . Asst. Treas. Hamilton Mfg. Co. . . 70 Kilby St. Room 48
. . . . . Boston, Mass. . . . . Apr. 25, 1901.
Henry Williams . . . Supt. Canoe River Mill, 53 Broadway, Taunton, Mass. . . . Apr. 23, 1903.

Digitized by Google

Broadus E. Willingham, Sec'y. and Treas. Willingham Cotton Mills . . . . . Macon, Ga. . . . . Oct. 18, 1900.
Elias S. Willis . . . . Supt. N. E. Cotton Yarn Co. . . . . Taunton, Mass. . . Apr. 23, 1903.
Merton J. Wilmarth . . Supt. J. L. & T. D. Peck Mfg. Co. . . . . 44 Myrtle St., Pittsfield, Mass. . . . Apr. 25, 1907.
George A. Wilson . . . Supt. Whitman Mills, 171 Davis St., New Bedford, Mass. . Apr. 25, 1907.
Newton Wilson . . . . Supt. Samson Cordage Works . . . Shirley, Mass. . . . Apr. 25, 1907.
R. L. Wilson . . . . . Gen. Mgr. Floyd Mills . . . . . Rome, Ga. . . . . Apr. 25, 1907.
William E. Winchester . Director Mississippi Textile School, Agricultural College, Miss. Apr. 24, 1902.
Samuel F. Winsper . . Supt. Bennett Dept. N. E. Cotton Yarn Co., Mills 1, 2, 3, 4, ... 226 Grinnell St., New Bedford, Mass. . Apr. 23, 1903.
Rex G. Witherbee . . Asst. Supt. Utica Steam and Mohawk Valley Cotton Mills . . . . . Utica, N. Y. . . . . Apr. 26, 1906.
Charles W. Wood . . . Mills Mgr. Continental Cotton Duck Co. Hampden, ... Baltimore, Md. . . . Sept. 21, 1905.
George Wood . . . . Prest. and Treas. Millville Manufg. Co. . . . . 626 Chestnut St., Philadelphia, Pa. . . Oct. 16, 1872.
John P. Wood . . . . . 521 N. 22d St., Philadelphia, Pa. . . Apr. 28, 1897.
Kenneth F. Wood . . Supt. Sayles Bleacheries . . . . . Sayesville, R. I. . . . Sept. 13, 1906.
Oscar W. Wood . . . Treas. Germantown Spinning Co. . . . . High St., Germantown, Philadelphia, Pa. . . Oct. 18, 1900.
William P. Wood . . . Supt. Royal Weaving Co. . . . . Pawtucket, R. I. . . Apr. 26, 1906.
Marcus J. Woodrow . . Supt. Clinton Mfg. Co., 93 Clinton St., Woonsocket, R. I. . Apr. 26, 1906.
Wm. I. Woodward . . Agt. Shetucket Co. . . . . Norwich, Conn. . . Apr. 23, 1903.
Frank F. Woolley . . . Supt. Coventry Co. . . . . Anthony, R. I. . . . Apr. 27, 1905.
George W. Wright . . Supt. Shove Mills . 590 Locust St., Fall River, Mass. . . Apr. 26, 1906.

Adelbert R. Young . . Supt. Ashland Cotton Co. . . . . Jewett City, Conn. . . Apr. 25, 1894.
James M. Young . . . Mgr. Hamilton Cotton Co. . . . . Hamilton, Ont., Can. Apr. 27, 1899.
Lewis J. Young . . . . Supt. Gault Mills of Montreal Cotton Co. . . . . Lock Box 240, Valleyfield, P. Q., Canada . . . . . Oct. 1, 1903.

George E. Zellers . . . Mgr. John Farnum & Co., Nos. 2 and 3 Mills . . . . . 214 South Prince St., Lancaster, Pa. . . . Apr. 25, 1907.

ASSOCIATE MEMBERS.

Eugene C. Andres . . . . . 127 Federal St., Boston, Mass. . . . Oct. 18, 1900.
Henry B. Ashton . . . . . 8 Webster Park, Brookline, Mass. . . Apr. 26, 1900.
Henry Ashworth . . . Ashworth Bros. . . . . 89 Globe Mills Ave., Box 427, Fall River, Mass. . . Apr. 28, 1897.

Digitized by Google

George R. Babbitt . . . Prest. and Gen. Mgr. American Oil Co. and Prest. and Treas.
. . . . . The Burke Eng. Co., 182 So. Water St., Providence, R. I. . Apr. 24, 1895.
Harry Gage Baker . . Lowell Machine Shop & Kitson Machine Shop . . . . .
. . . . . Lowell, Mass. . . . Sept. 21, 1905.
D. C. Ball . . . . . 5 Beekman St., New York, N. Y. . . Oct. 25, 1895.
Edwin Barnes . . . . Vice Prest. American Textile Appliances Co. . . . . .
. . . . . 79 Milk St., Boston, Mass. . . . . Apr. 26, 1900.
George S. Barnum . . Sec'y. and Treas. The Bigelow Co. . New Haven, Conn. . Apr. 24, 1895.
Colin C. Bell . . . . Vice-Prest. American Vulcanized Fibre Co. . . . . .
. . . . . 12 Pearl St., Boston, Mass. . . . Apr. 29, 1896.
Frank P. Bennett . . . Publisher American Wool and Cotton Reporter . . . . .
. . . . . 530 Atlantic Ave., Boston, Mass. . . . Sept. 22, 1896.
Edward H. Best . . . Woolen Merchant, 224 Purchase St., Boston, Mass. . . Apr. 23, 1903.
Albert Birch . . . . . Prop. & Mgr. Birch Bros. Co., ...
. . . . . 32 Kent St., Somerville, Mass. . . Oct. 2, 1902.
F. H. Bishop . . . . . Gen. Mgr. Universal Winding Co. . . . . .
. . . . . 95 South St., Boston, Mass. . . . . Apr. 26, 1900.
Edmund E. Blake . . Agt. Saco & Pettee Machine Shops . . . Biddeford, Me. . Oct. 2, 1902.
Charles A. Bowen . . Treas. & Gen. Mgr. S. C. Lowe Supply Co. . . . . .
. . . . . 87 Union St., New Bedford, Mass. . Apr. 26, 1906.
Arthur T. Bradlee . . Mem. firm of Harding, Whitman & Co. . . . . .
. . . . . 78 Chauncy St., Boston, Mass. . . . . Apr. 25, 1901.
J. Frank Braids . . . . Vice Prest. Charles S. Bush Co. . . . . .
. . . . . P. O. Box 20, 212 Weybosset St., Providence, R. I. . . Apr. 28, 1897.
Samuel N. Braman . . Engineer Westinghouse Machine Co. . . . . .
. . . . . 131 State St., Boston, Mass. . . . Apr. 27, 1905.
James H. Brand, Jr. . . Cotton Broker . . . . . .
. . . . . 201 Board of Trade Building, Montreal, P. Q. . . . Sept. 13, 1906.
Henry Gordon Brinckerhoff, N. E. Mgr. Green Fuel Economizer Co., ...
. . . . . Rms. 701-703 Oliver Building, 141 Milk St., Boston, Mass. . . . Sept. 22, 1896.
Harry S. Brown . . . New England Mgr. Power Specialty Co. . . . . .
. . . . . 10 Postoffice Square, Boston, Mass. . . . Sept. 21, 1905.
H. Martin Brown . . . Treas. U. S. Bobbin & Shuttle Co. . Providence, R. I. . . Apr. 24, 1895.
George L. Brownell . . Inventor and Builder of Improved Twisting Machinery . .
. . . . . 49 Union St., Station A, Worcester, Mass. . . Apr. 23, 1903.
Percy H. Brundage . . . . . 49 Wall St., New York, N. Y. . . Oct. 5, 1899.
W. Irving Bullard . . . V. P., E. H. Jacobs Mfg. Co. . . . . Danielson, Conn. . . Apr. 25, 1907.
John H. Burghardt . . Page Belting Co. . . . 31 Pearl St., Boston, Mass. . . . Apr. 24, 1895.
Charles B. Burleigh . . Textile Power Dept., General Electric Co. . . . . .
. . . . . 84 State St., Boston, Mass. . . . Oct. 1, 1903.
Eugene E. Burnham . . Belt Mfr. . . . . 252 Lowell St., Lawrence, Mass. . . Oct. 25, 1895.
Hermon N. Burpee . . Gen. Sales Mgr., Barber-Colman Co. . . . . .
. . . . . 77 Washington St., North, Boston, Mass. . . . Sept. 13, 1906.
Arthur Cecil Butler . . Agt. for E. A. Leigh, ... 232 Summer St. Boston, Mass. Apr. 28, 1904.
Harry W. Butterworth . Sec'y. H. W. Butterworth & Sons . . . . . .
. . . . . York and Cedar Sts., Philadelphia, Pa. . . Oct. 28, 1897.

Digitized by Google

James Butterworth . Prest. H. W. Butterworth & Sons . . . . . .
. . . . . York and Cedar Sts., Philadelphia, Pa. . . Apr. 24, 1895.

L. W. Campbell . . . Agt. Woonsocket Machine and Press Co. . . . . .
. . . . . Woonsocket, R. I. . . Sept. 22, 1904.
Malcolm Campbell . . Gen. Mgr. Woonsocket Machine and Press Co. . . . . .
. . . . . Woonsocket, R. I. . . Apr. 24, 1895.
W. W. Carey . . . . . Mfr. Wood Rim Pulleys and Wood Working Machinery . .
. . . . . 514 Broadway, Lowell, Mass. . . . . Apr. 24, 1895.
Albert C. Case . . . . . 5 Nassau St., New York, N. Y. . . Sept. 26, 1901.
Charles F. Chase . . . Eastern Mgr. Cling Surface Co., of Buffalo . . . . . .
. . . . . 39 Cortlandt St., New York, N. Y. . Sept. 21, 1905.
J. E. Cheesman . . . . Prest. Cheesman Cotton Gin Co. . . . . .
. . . . . 76 William St., New York, N. Y. . . Oct. 5, 1899.
Charles H. Child . . . Treas. Standard Mill Supply Co. . . . . .
. . . . . P. O. Box 1426, 39 Exchange Place, Providence, R. I. . . Apr. 24, 1895.
Thomas J. Clexton . . Mgr. A. Klipstein & Co. . . . . .
. . . . . 285 Congress St. Boston, Mass. . . . Sept. 13, 1906.
Melvin H. Coffin . . . Selling Agt. Whitin Machine Works Whitinsville, Mass. . Oct. 2, 1902.
Howard D. Colman . . Prest. and Treas. Barber-Colman Co. Rockford, Ill. . . . Apr. 27, 1905.
James A. Cooper . . . Whitin Machine Works . . . . . Whitinsville, Mass. . Sept. 13, 1906.
Charles C. Cowan . . . The Tontine Bldg., Rms. 1106, 1107 . . . . . .
. . . . . 82 Wall St., New York, N. Y. . . Oct. 5, 1899.
Thomas G. Cox . . . . Selling Agt. Mason Machine Works . . . . . .
. . . . . P. O. Box 316, Taunton, Mass. . . . Apr. 24, 1895.
Stuart W. Cramer . . . Southern Agt., The Whitin Machine Works . . . . . .
. . . . . Woonsocket Machine & Press Co. . Charlotte, N. C. . . Apr. 26, 1906.
Randolph Crompton . . Mem. firm of Crompton-Thayer Loom Co. . . . . .
. . . . . Worcester, Mass. . . Oct. 28, 1897.
C. F. Curwen . . . . Treas. Dinsmore Mfg. Co. . . . . Salem, Mass. . . . . Apr. 27, 1899.
Joseph L. Cushing . . Prop. Daniel Cushing & Co., Box 885, Lowell, Mass. . . . Apr. 26, 1900.

Frederick I. Dana . . . Gen. Sales Mgr., The Textile Machinery Finishing Co. . .
. . . . . Howard Bldg., 83 Exchange Place, Providence, R. I. . . Apr. 24, 1895.
Hugh De Haven . . Prop. De Haven Mfg. Co. . . . . .
. . . . . 50-54 Columbia Heights, Brooklyn, N. Y. . . Apr. 23, 1903.
John O. DeWolf, . . . Mech. Engineer, 159 Devonshire St., Boston, Mass. . . . Apr. 25, 1901.
Frederick N. Dillon . . D. M. Dillon Steam Boiler Works . Fitchburg, Mass. . . Sept. 22, 1904.
Ezra Dixon . . . . . Prest. and Treas. Dixon Lubricating Saddle Co. Bristol, R. I. Sept. 21, 1905.
Robert D. Douglas . . Cop Tube Manufacturer . . . . . .
. . . . . P. O. Box 704, 402 Bay St., Fall River, Mass. . . Sept. 21, 1905.
C. E. W. Dow . . . . Selling Agt. American Moistening Co. . . . . .
. . . . . P. O. Box 2189, 79 Milk St., Boston, Mass. . . . Apr. 24. 1895.

Digitized by Google

Frederick A. Downes . Prest. Keystone Mutual Fire Insurance Co. . . . . .
. . . . . 925 Chestnut St., Philadelphia, Pa. . . Oct. 28, 1897.
Clare H. Draper . . . Experimental Dept. Draper Co. . . Hopedale, Mass. . . Sept. 21, 1905.
W. L. Draper . . . . Factory Buildings Trust, 253 A St., South Boston, Mass. Oct. 18, 1900.

Charles E. Eager . . . Member firm J. Russel Marble & Co. . . . . .
. . . . . 124 High St., Boston, Mass. . . . Apr. 27, 1905.
Fred W. Easton, . . . Treas. Easton & Burnham Machine Co., ...
. . . . . 180 Weeden St., Pawtucket, R. I. . . Apr. 25, 1901.
William Dresser Edwards, Cons. Eng. Randolph Bldg. . . . . Memphis, Tenn. . . Oct. 2, 1902.
G. B. Emmons . . . . Prest. Emmons Loom Harness Co. . . . . .
. . . . . 7 May St., Lawrence, Mass. . . Oct. 25, 1895.
George P. Erhard . . . Vice-Prest. & Treas. The Stafford Co. Readville, Mass. . . Apr. 27, 1905.

D. D. Felton . . . . . Treas. S. A. Felton & Son Co. . . . Manchester, N. H. . Apr. 24, 1895.
John W. Ferguson . . Contractor . . . . . .
. . . . . Paterson Nat. Bank Bldg., Paterson, N. J. . . . Apr. 24, 1895.
E. C. Foerster . . . . Treas. American Textile Specialty Machinery Co. . . . .
. . . . . 363–373 Rider Ave., New York, N. Y. . . Sept. 22, 1904.
J. Herbert Foster . . . Cotton Broker . 10 South Water St., Providence, R. I. . . Apr. 24, 1895.
E. T. Fowler . . . . . Treas. and Mgr. Foster Machine Co., Westfield, Mass. . . Apr. 26, 1906.
John T. Fyans . . . . Agt. Fyans, Frazer & Blackway Co. . . . . .
. . . . . 411 Beach St., Fall River, Mass. . . Apr. 28, 1897.

H. P. Garland . . . . Treas. Garland Mfg. Co. . . . . Saco, Me. . . . . Oct. 25, 1895.
Royal W. Gates . . . . Supply Dealer . . 307 Market St., Lowell, Mass. . . . Apr. 24, 1895.
Roland Gerry . . . . Asst. General Sales Agt. Jones & Laughlin Steel Co. . . .
. . . . . Pittsburg, Pa. . . . . Sept. 13, 1906.
Vladimir F. Gnesin . . Care, The Great Yaroslavl Mfg. Co. Moscow, Russia . . . Oct. 1, 1903.
Rufus B. Goff . . . . Prest. Standard Mill Supply Co. . . . . .
. . . . . 77 Exchange Pl., Box 714, Providence, R. I. . . Apr. 28, 1897.
Arthur F. Gray . . . . Architect and Mill Engineer . . . . . .
. . . . . 53 State St., Room 509, Boston, Mass. . . . Oct. 18, 1900.
Samuel M. Green, C. E. The American Thread Co. . . . . Holyóke, Mass. . . . Apr. 24, 1902.
Harry S. Greene . . . Vice Prest. Woonsocket Napping Machinery Co. . . . .
. . . . . Woonsocket, R. I. . . Apr. 26, 1906.
Henry S. Greene, . . . Treas. Woonsocket Napping Machinery Co. . . . . .
. . . . . Woonsocket, R. I. . Apr. 26, 1906.
S. Harold Greene . . . Starch Manufacturer . . 367 Atlantic Ave., Boston, Mass. . Apr. 27, 1905.
Russell Grinnell . . . Vice Prest. Gen. Fire Extinguisher Co. . . . . .
. . . . . P. O. Box 89, Providence, R. I. . . Apr. 26, 1906.
Edmond H. Guerin . . Mgr. American Paper Tube Co. . . Woonsocket, R. I. . . Apr. 25, 1907.

Digitized by Google

George B. Hamblin . . Purchasing Agt. Whitin Machine Works . . . . . Whitinsville, Mass. . Apr. 25, 1907.
A. Walter Harris . . . Treas. A. W. Harris Oil Co. . . . . Box 758, 326 So. Water St., Providence, R. I. . . Oct. 25, 1895.
Alfred H. Hartley . . Dealer in Oils and Mill Supplies . . . . . Box 409, Fall River, Mass. . . Oct. 28, 1897.
Arthur A. Haserick . . Member of Firm Stoddard, Haserick, Richards & Co. . . . . 152 Congress St., Boston, Mass. . . . . Sept. 13, 1906.
Edgar F. Hathaway . . Gen. Mgr., American Warp Drawing Machines . . . . . 289 A St., Boston, Mass. . . . Apr. 27, 1905.
William C. Hawes . . Director Taber Mill . . Pleasant St., New Bedford . . . . Sept. 13, 1906.
Jeffrey Hazard . . . . Prest. Hazard Cotton Co. . . . . Providence, R. I. . . Apr. 25, 1907.
Charles C. Hedrick . . Mech. Eng. Lowell Machine Shop . Lowell, Mass. . . . Apr. 23, 1903.
Charles M. Heminway . Treas. Consolidated Engine Stop Co. . . . . 130 East 12th St., New York City . . . Apr. 25, 1907.
Richard H. Hill . . . Gen. Sales Agt. James Hunter Machine Co. . . . . 70 Kilby St., Boston, Mass. . . . . Apr. 26, 1900.
John Hogg . . . . . Smith, Hogg & Gardiner, 144 Essex St., Boston, Mass. . . . Apr. 27, 1899.
Henry S. Houghton, Sr., Mfr. Grids and Beaters, ... 74 Hamlet Ave., Woonsocket, R. I. . Apr. 28, 1897.
Lewis T. Houghton . . Mfr. Metal Thread Boards . . . . . 89 Exchange St., Worcester, Mass. . . Sept. 26, 1901.
A. H. Howard . . . . Prest. and Treas. Howard Bros. Mfg. Co. . . . . P. O. Box 54, Worcester, Mass. . . Sept. 26, 1901.
Frederic W. Howe . . Mgr. Providence Dept., Crompton & Knowles Loom Works . . . . . 241 Harris Ave., Box 899, Providence, R. I. . . Apr. 24, 1902.
Samuel T. Hubbard . . Cotton Merchant, Hubbard Bros. & Co. . . . . 66 Beaver St., New York City . . . Sept. 13, 1906.
C. H. Hutchins . . . . Prest. Crompton & Knowles Loom Works . . . . . Worcester, Mass. . . Oct. 25, 1895.

Daniel Jackson . . . . Cotton Buyer B. B. and R. Knight, . Providence, R. I. . . Apr. 24, 1902.
Albert A. Jenks . . . Prest. Fales & Jenks Machine Co. . Pawtucket, R. I. . . Sept. 21, 1905.

Lawrence M. Keeler . Whitin Machine Works . . . . . Whitinsville, Mass. . Sept. 26, 1901.
William B. Kehew . . The Kehew-Bradley Co., ... 24 Purchase St., Boston, Mass. . . . Apr. 24, 1895.
John E. Kendrick . . . Prest. American Supply Co., Box 822 . . . . . 11 Eddy St., Providence, R. I. . . Oct. 5, 1899.
Frank B. Kenney . . . Mgr. Care of T. C. Entwistle Co. . . . . 297 Market St., Lowell, Mass. . . . Oct. 5, 1899.
Nathaniel Kinsman . . Choremi Benachi & Co., 53 State St., Boston, Mass. . . . . Apr. 25, 1907.

W. C. Langford . . . Salesman, ... 14 Peck St., Providence, R. I. . . Apr. 27, 1899.

Digitized by Google

Daniel G. Langlands . James S. Roberts Co., 137 Portland St., Boston, Mass. . . . . Apr. 25, 1907.
Josiah M. Lasell . . . Whitin Machine Works, ... Whitinsville, Mass. . Apr. 24, 1895.
John H. Lawrence . . Top Roll Mfr. . . . . New Bedford, Mass. . Apr. 28, 1904.
Frank A. LeValley . . Cotton Broker, Care of Tuttle, Hurley & Co. . . . . Fall River, Mass. . . Apr. 28, 1904.
John H. Lorimer . . . Builder of Textile Machines . . . . . Ontario and Lawrence Sts., Philadelphia, Pa. . . Oct. 28, 1897.
Stephen C. Lowe . . . Agt. John Hetherington & Sons, Ltd., ... 186 Devonshire St., Boston, Mass. . . . Oct. 25, 1895.

Rowland N. Mackay . Agt. The Stafford Co. . . . . Readville, Mass. . . Sept. 21, 1905.
Francis E. Macomber . Mill Supplies . . . . 88 Broad St., Boston, Mass. . . . . Apr. 26, 1900.
Augustus B. Marble . . Jones & Laughlin Steel Co., Board of Trade Bldg. . . . . Boston, Mass. . . . Apr. 25, 1907.
Edwin H. Marble . . . Vice-Prest. Curtis & Marble Machine Co. . . . . Cambridge St., Worcester, Mass. . . Sept. 13, 1906.
Edwin T. Marble . . . Prest. and Treas. Curtis & Marble Machine Co. . . . . Cambridge St., Worcester, Mass. . . Sept. 13, 1906.
Edward L. Martin . . Selling Agent, Howard & Bullough American Machine Co. . . . . Pawtucket, R. I. . . Apr. 25, 1907.
Fay H. Martin . . . . Prest. Textile Machinery Co. . . . . 60 India St., Boston, Mass. . . . . Sept. 26, 1901.
Henry W. Mason . . . Cotton Dealer, . 10 South Water St., Providence, R. I. . . Apr. 27, 1905.
F. H. Maynard . . . . Prest. & Mgr. Gen. Fire Extinguisher Co. . . . . Providence, R. I. . . Apr. 24, 1895.
John McCullough . . . Cotton Waste Merchant . . . . . New Bedford, Mass. . April 25, 1901.
J. Franklin McFadden . Member Firm George H. McFadden & Bro. . . . . 121 Chestnut St., Philadelphia, Pa. . . . Sept. 13, 1906.
H. G. McKerrow . . . Textile Machinery Importer . . . . . 31 State St., Boston, Mass. . . . Sept. 22, 1896.
D. K. McLaren . . . . Mfr. of Leather Belting 751 Craig St., Montreal, P. Q., Can. Apr. 26, 1900.
Meldon H. Merrill . . Eng. Westinghouse Elec. & Mfg. Co., ... 716 Board of Trade Bldg. Boston, Mass. . . . . Sept. 22, 1904.
Charles B. Moore . . . Mgr. Knowles Steam Pump Works . . . . . 42 Batterymarch St., Boston, Mass. . . . . Apr. 26, 1900.
Fred Moss . . . . . Holland & Webb, Commission Merchants . . . . . 495 Broome St., New York, N. Y. . . Sept. 21, 1905.
W. C. Murphy . . . . Union Hardware & Electric Supply Co. Providence, R. I. . . Apr. 25, 1907.

Hugh Nelson . . . . Mgr. Casualty Co. of America . . . . . 52 William St., New York City . . Apr. 26, 1906.
John H. Nelson . . . . Treas. William Firth Co. . . . . 60 Baltimore St., Lynn, Mass. . . . . Apr. 26, 1900.
Charles H. Newman . . Webster Mfg. Co. 88 & 90 Reade St., New York, N. Y . . . Sept. 21, 1905.

Digitized by Google

William R. Noone, Jos. Noone's Sons Co. . . 102 South St., Boston, Mass. . . . Oct. 28, 1897.

Thos. J. O'Keefe . . . Amer. Belting and Tanning Co. . . . . 135 Oliver St., Boston, Mass. . . . . Apr. 28, 1904.
Sidney B. Paine . . . General Electric Co. . . 84 State St., Boston, Mass. . . . Apr. 24, 1895.
William F. Parish, Jr. . Chief Engineer, Deutsche Vacuum Oil Co. . . . . Berlin, N. W. 7 Reichstagsufer 16, Germany, Apr. 24, 1902.
Arthur Parkinson . . . Prest. Royal Chemical Co. . . . . Olneyville, R. I. . . Apr. 28, 1897.
John Parmenides . . . Choremi, Benachi & Co., 50 State St., Boston, Mass. . . . . Apr. 27, 1905.
John Perkins . . . . . Sales Agt. Hewes & Phillips Iron Works . . . . . 735 Oliver Bldg., 141 Milk St., Boston, Mass. . . . Apr. 25, 1907.
James C. Potter . . . . Prest. of Potter & Johnson Co. . . . Pawtucket, R. I. . . Sept. 21, 1905.
Charles A. M. Praray . Chas. A. M. Praray & Co., Architect and Mill Engineer . . . . . 48 Weybosset St., Providence, R. I. . . Apr. 28, 1897.
Charles F. Pray . . . . Cloth Broker . . . 66 Leonard St., New York, N. Y. . . Apr. 28, 1904.
James M. Prendergast . J. M. Prendergast & Co., Brokers in Cotton Cloths and Yarns . . . . . 87 Milk St., Boston, Mass. . . . Apr. 26, 1906.
Theodore H. Price . . Cotton Dealer . . . 82 Beaver St., New York, N. Y. . . Oct. 2, 1902.

Frank W. Reynolds . . Mem. firm Lockwood Greene & Co. . . . . 93 Federal St., Boston, Mass. . . . Apr. 28, 1904.
Richard H. Rice . . . Engineer Turbine Dept. Gen. Elec. Co. West Lynn, Mass. . . Apr. 24, 1895.
E. R. Richardson . . . Asst. Treas. Howard & Bullough American Machine Co., Ltd. . . . . Box 678, Pawtucket, R. I. . . Apr. 26, 1900.
C. E. Roberts . . . . Mgr. Hartford Steam Boiler Inspection & Insurance Co. . . . . 101 Milk St., Room 400, Boston, Mass. . . . Apr. 24, 1895.
Charles Robbins . . . Eng. Westinghouse Electric & Mfg. Co., Care of Westing- . . . . . house Electric & Mfg. Co. . . East Pittsburg, Pa. . Apr. 25, 1907.
Elwin H. Rooney . . . The Whitin Machine Works . . . Whitinsville, Mass. . Apr. 26, 1906.
E. A. Rusden . . . . Gen. Mgr. Textile Finishing Machinery Co. . . . . Howard Building, 83 Exchange Place, Providence, R. I. . . Sept. 21, 1905.

J. L. Sanford . . . . . Acting Mgr. Barber-Colman Co. . . . . 77-79 Washington St., North, Boston, Mass. . . . Apr. 27, 1905.
Dwight Seabury . . . Mill Engineer . . . 12 East Ave., Pawtucket, R. I. . . Apr. 25, 1901.
Frederick P. Shaw . . Prest. and Gen. Mgr. Shaw Machine Co. . . . . Lowell, Mass. . . . Apr. 26, 1906.
William N. Shaw . . . Treas. The Lincoln Iron Works and Jackson Architectural . . . . . Iron Works . . 31 E. 17th St., New York, N. Y. . . Apr. 24, 1902.
Arthur N. Sheldon . . F. P. Sheldon & Co. Mill Engineers . . . . . 49 Westminster St., Providence, R. I. . . Sept. 13, 1906.
Lewis T. Shurtleff . . . Agt. Paper Department, Pairpont Corporation, ... New Bedford, Mass. Apr. 28, 1904.

Digitized by Google

Abbott P. Smith . . . Director Soule, Butler and Kilburn Mills . . . . . .
. . . . . Seventh St., New Bedford, Mass. . . Sept. 13, 1906.
H. Cowles Smith . . . Mgr. Eastern Dist. Acme Flexible Clasp Co. . . . . .
. . . . . 28 Elm St., New York City . . . Apr. 25, 1907.
Harry M. Smith . . . . . Worcester, Mass. . . Apr. 28, 1897.
R. Paul Snelling . . . Treas. Saco and Pettee Machine Shops . . . . . .
. . . . . Newton Upper Falls, Mass. . Sept. 22, 1896.
W. A. Spellissy . . . . Jenckes Spinning Co. . . . . Philadelphia, Pa. . . Sept. 21, 1905.
Henry C. Spence . . . Gen. Mgr. Metallic Drawing Roll Co. Indian Orchard, Mass. Apr. 24. 1895.
Wallace I. Stimpson . Salesman The Draper Co., 16 Church St., Milford, Mass. . . Sept. 21, 1905.
Jacob Stephans . . . . Gen. Mgr. William H. Haskell Mfg. Co. . . . . .
. . . . . Pawtucket, R. I. . . Apr. 26, 1906.
James Strang . . . . Selling Agt. Metallic Drawing Roll Co. . . . . .
. . . . . 123 Hampden St., Indian Orchard, Mass. Oct. 28, 1897.
Adolph Suck . . . . . Mill Architect & Engineer . . . . . .
. . . . . 179 Summer St., Boston, Mass. . . . Apr. 25, 1907.
Daniel J. Sully . . . . . New York City . . . Apr. 24, 1895.
E. Kent Swift . . . . Asst. Treas. Whitin Machine Works, Whitinsville, Mass. . . Apr. 27, 1905.
John Sykes, J. P. . . . Prest. English Card Clothing Co. . . . . .
. . . . . Acre House, Huddersfield, Eng. . Oct. 18, 1900.

Charles F. Taylor . . . Prop. Burgess Cop Tube Co., ...
. . . . . 15 Custom House St., Providence, R. I. . . Apr. 27, 1898.
Robert Taylor, Jr. . . . Managing Director Soho Iron Wks., Oldham, England . . Apr. 28, 1904.
George C. Tewksbury . Agt. American Ship Windlass Co. . . . . .
. . . . . 141 Milk St., Room 1102 Boston, Mass. . . . Apr. 24, 1902.
Gay D. Thayer . . . . Salesman, Crompton & Knowles Loom Works . . . . . .
. . . . . 667 Main St., Worcester, Mass. . . Apr. 25, 1907.
James T. Thornton . . Treas. Thornton Machinery Co. . . Providence, R. I. . . Oct. 18, 1900.
William V. Threlfall . . Chapman Valve Mfg. Co. . . . . Indian Orchard, Mass., Apr. 24, 1895.
Rienzi W. Thurston . Mach. Mfr. . . . . Fall River, Mass. . . Oct. 18, 1900.
A. Curtis Tingley . . . Treas. National Ring Traveler Co. . . . . .
. . . . . 257 West Exchange St., Providence, R. I. . . Sept. 22, 1896.
Allison W. Trafford . . Mfr. of Ring Travelers . . . . . .
. . . . . 221–223 Pocasset St., Fall River, Mass. . . Apr. 26, 1900.

Frank H. Underwood . Resident Mgr. Dodge Mfg. Co. . . . . .
. . . . . 137 Purchase St., Boston, Mass. . . . Apr. 29, 1896.

Clement A. Wakefield . Selling Agt. Saco & Pettee Machine Shops, ...
. . . . . 38 South St., Biddeford, Me. . . . Apr. 25, 1901.
Justin A. Ware . . . . . Spring Hill, Barnstable County, Mass. Oct. 25, 1895.
William Warr . . . . Pacific Electrical Building . . . . . Los Angeles, Cal. . . Apr. 27, 1905.
Lettice R. Washburn . Mill Contractor, 235 North Water St., New Bedford, Mass. . Oct. 5, 1899.

Digitized by Google

Walter S. Watson	Haworth & Watson, Mfrs. Paper Tubes for Textile Manufg.	Box 996, Lowell, Mass.	Oct. 25, 1895.
Stephen M. Weld	Stephen M. Weld & Co., 89 State St.,	Boston, Mass.	Apr. 27, 1899.
William R. West	Roll Coverer	830 Purchase St., New Bedford, Mass.	Sept. 22, 1896.
W. W. White	Prest. Holyoke Machine Co.	Worcester, Mass.	Apr. 27, 1899.
John K. Whittier	Supt. Kitson Machine Shop	Lowell, Mass.	Sept. 21, 1905.
G. Marston Whitin	Treas. Whitin Machine Works	Whitinsville, Mass.	Apr. 24, 1895.
Fred A. Wilde	The Stafford Co.	Readville, Mass.	Apr. 28, 1897.
Thomas Winn	Textile Dept., The Arabol Mfg. Co.	100 William St., New York City	Apr. 25, 1907.

Honorary Members	5
Life Members	14
Active Members	749
Associate Members	193
Total Membership	961

Digitized by Google

MEMBERS OF THE ASSOCIATION,

May 1, 1907.

ARRANGED BY STATES.

MAINE.

Auburn	William Hayes	Barker Mill.
Augusta	Albert S. Pratt	Edwards Mfg. Co.
Biddeford	Edmund E. Blake	Saco & Pettee Machine Shops.
Biddeford	Harry D. Lord	Saco & Pettee Machine Shops.
Biddeford	Robert McArthur	Pepperell Mfg. Co.
Biddeford	Clement A. Wakefield	Saco & Pettee Machine Shops.
Brunswick	Russell W. Eaton	Cabot Manufg. Co.
Kennebunk	Robert W. Lord	R. W. Lord & Co.
Lewiston	George W. Bean	Androscoggin Mills.
Lewiston	H. B. Estes	Continental Mills.
Lewiston	William D. Pennell	Hill Manufg. Co.
Lewiston	Herbert L. Pratt	Bates Manufg. Co.
Portland	Lyman M. Cousens	Dana Warp Mills.
Richmond	George Fish	Knapp Spinning Mills.
Saco	H. P. Garland	Garland Mfg. Co.
Saco	James G. Garland	Garland Mfg. Co.
Saco	Elmer E. Page	York Manufg. Co.
Westbrook	Philip Dana	Dana Warp Mills.
Westbrook	Woodbury K. Dana	Dana Warp Mills.
West Kennebunk	W. K. Sanborn	R. W. Lord Co.

NEW HAMPSHIRE.

Charlestown	Samuel Webber	Hydraulic Engineer.
Claremont	Frank P. Vogl	Monadnock Mills.
Dover	Charles H. Fish	Cocheco Manufg. Co.
Dover	Herbert W. Owen	Cocheco Manufg. Co.
Exeter	Chester D. Hatch	Exeter Mfg. Co.

Digitized by Google

Greenville	Frederick W. Ely	Columbian Manufg. Co.
Hooksett	Stephen N. Bourne	Dundee Mills.
Manchester	Henry Deane Bourne	Hooksett Manufg. Co.
Manchester	D. D. Felton	S. A. Felton & Son Co.
Manchester	Elliott Cowdin Lambert	Amoskeag Manufg. Co.
Manchester	Charles H. Manning	Amoskeag Manufg. Co.
Manchester	Herman F. Straw	Amoskeag Manufg. Co. & Manchester Mills.
Manchester	George F. Whitten	
Manchester	John H. Whitten	Stark Mills.
Milford	M. F. Foster	
Nashua	William F. Arthur	Nashua Manufacturing Co.
Nashua	Harry H. Blunt	Wonolancet Co.
Nashua	William H. Cadwell	Jackson Co.
Nashua	Almon A. Milliken	The Jackson Co.
Nashua	Roscoe S. Milliken	Nashua Mfg. Co.
Nashua	Walter Whipple	Nashua Mfg. Co.
Newmarket	William H. Garner	Newmarket Mfg. Co.
Penacook	F. E. Wattles	Boscawen Mills.
Peterboro	Albert W. Noone	Jos. Noone's Son's Co.
Pittsfield	William P. Adams	Pittsfield Mills.
Salmon Falls	J. Colby Lewis	Salmon Falls Mfg. Co.
Somersworth	Charles H. Plummer	Great Falls Manufg. Co.
Suncook	William G. Nichols	China, Webster & Pembroke Mills.

VERMONT.

Burlington	Reuben A. Cooke	Queen City Cotton Co.
Burlington	Winthrop Parker	Queen City Cotton Co.
North Pownal	Thomas Armstrong	North Pownal Manufg. Co.

MASSACHUSETTS.

Adams	Joseph Brierley	W. C. Plunkett & Sons Warp Mill.
Adams	Z. D. Hall	Berkshire Cotton Manufg. Co.
Adams	Emil Kipper	Blackington Mfg. Co.
Adams	Charles T. Plunkett	Berkshire Cotton Manufg. Co.
Adams	William B. Plunkett	Berkshire Cotton Mfg. Co., and Greylock Mills.
Adams	William C. Plunkett	W. C. Plunkett & Sons.
Adams	J. N. Sanderson	Renfrew Mfg. Co.
Adams	Charles R. Thomson	Renfrew Mfg. Co.
Adamsdale	Fred B. Manley	Spencer Yarn Co.
Amesbury	W. S. Hume	Hamilton Woolen Co.
Amesbury	Frederick J. Quinn	Hamilton Woolen Mills.

Digitized by Google

Andover	John W. Bell	Smith & Dove Manufg. Co.
Blackstone	George E. Spofford	Blackstone Manufg. Co.
Bondsville	Elmer G. Childs	Boston Duck Co.
Bondsville	Samuel Stewart	Boston Duck Co.
Boston	Charles B. Amory	Hamilton Mfg. Co.
Boston	Frederic Amory	189 Devonshire St.
Boston	Eugene C. Andres	127 Federal St.
Boston	E. W. Atkinson	Stoddard, Haserick, Richards & Co.
Boston	Nathaniel F. Ayer	70 Kilby St.
Boston	Edwin Barnes	American Textile Appliances Co.
Boston	Colin C. Bell	American Vulcanized Fibre Co.
Boston	Albert Farwell Bemis	Jackson Fibre Co.
Boston	Frank P. Bennett	Am. Wool and Cotton Reporter.
Boston	Edward H. Best	Woolen Merchant.
Boston	F. H. Bishop	Universal Winding Co.
Boston	Arthur T. Bradlee	Harding, Whitman & Co.
Boston	Samuel N. Braman	Westinghouse Machine Co.
Boston	S. Parker Bremer	Monadnock Mills.
Boston	Henry Gordon Brinckerhoff	Green Fuel Economizer Co.
Boston	Harry S. Brown	New England Power Specialty Co.
Boston	John H. Burghardt	Page Belting Co.
Boston	Charles B. Burleigh	General Electric Co.
Boston	Hermon N. Burpee	Barber-Colman Co.
Boston	Arthur Cecil Butler	232 Summer St.
Boston	D. Allison Carrick	Sycamore Mills.
Boston	Thomas J. Clexton	A. Klipstein & Co.
Boston	Frank B. Comins	American Moistening Co.
Boston	Daniel J. Danker	Danker & Marston.
Boston	Augustus De Cort	724 Exchange Building.
Boston	P. Y. DeNormandie	Pepperell Mfg. Co.
Boston	John O. DeWolf	159 Devonshire St.
Boston	C. E. W. Dow	150 Devonshire St.
Boston	Frederic C. Dumaine	Amoskeag Mfg. Co.
Boston	Charles E. Eager	J. Russel Marble & Co.
Boston	William Firth	Am. Moist. Co. and Wm. Firth Co.
Boston	Frederick O. Flather	Boott Mills.
Boston	Eugene N. Foss	Burgess Mills.
Boston	Alfred M. Goodale	Cloth and Yarn Broker.
Boston	Arthur F. Gray	53 State St., Room 509.
Boston	Edwin Farnham Greene	Lockwood, Greene & Co. and Dwight Mfg. Co.
Boston	S. Harold Greene	Starch Mfg.
Boston	Arthur A. Haserick	Stoddard, Haserick, Richards & Co.
Boston	Edgar F. Hathaway	American Warp Drawing Machine Co
Boston	Richard H. Hill	Jas. Hunter Machine Co.
Boston	William H. Hill	Renfrew Mfg. Co.
Boston	Franklin W. Hobbs	Arlington Mills.

Digitized by Google

Boston	John Hogg	Smith, Hogg & Gardiner.
Boston	Henry S. Howe	Dry Goods Commission.
Boston	Charles W. Hubbard	Ludlow Mfg. Associates.
Boston	Otis L. Humphrey	78 Chauncy St.
Boston	Joseph B. Jamieson	Holmes Knitting Co.
Boston	William B. Kehew	The Kehew-Bradley Co.
Boston	Nathaniel Kinsman	Choremi Benachi & Co.
Boston	Daniel G. Langlands	James S. Roberts Co.
Boston	Evan Arthur Leigh	232 Summer St.
Boston	William C. Lovering	Whittenton Mfg. Co.
Boston	Stephen C. Lowe	John Hetherington & Sons, Ltd.
Boston	Herbert Lyman	39 Beacon St.
Boston	Ronald T. Lyman	Boston Mfg. Co.
Boston	Francis E. Macomber	88 Broad St.
Boston	Charles T. Main	45 Milk St.
Boston	Augustus B. Marble	Jones & Laughlin Steel Co.
Boston	John P. Marston	Danker & Marston.
Boston	Fay H. Martin	Textile Machinery Co.
Boston	Fred C. McDuffie	24 Milk St.
Boston	H. G. McKerrow	31 State St.
Boston	Meldon H. Merrill	Westinghouse Elec. & Mfg. Co.
Boston	Charles B. Moore	Knowles Steam Pump Works.
Boston	George B. Morison	Ballou Yarn Co.
Boston	Robert W. Neff	Chemical Mfr.
Boston	Theodore O. Nicholson	Millen Mills.
Boston	William R. Noone	102 South St.
Boston	Thomas J. O'Keefe	135 Oliver St.
Boston	John Parmenides	Choremi, Benachi & Co.
Boston	Sidney B. Paine	General Electric Co.
Boston	John Perkins	Hewes & Phillips Iron Works.
Boston	James M. Prendergast	J. M. Prendergast & Co.
Boston	Henry Smith Pritchett, LL.D.	Mass. Institute of Technology.
Boston	Frank W. Reynolds	Lockwood Greene & Co.
Boston	Charles E. Riley	C. E. Riley & Co.
Boston	C. E. Roberts	Hartford Steam Boiler Insp. & Ins.Co.
Boston	Arnold B. Sanford	Am. Cotton Yarn Exchange.
Boston	J. L. Sanford	Barber-Colman Co.
Boston	J. Herbert Sawyer	93 Federal St.
Boston	George H. Shapley	Silver Lake Co.
Boston	Willis S. Shepard	American Net and Twine Co.
Boston	William F. Sherman	88 Broad St.
Boston	Adolph Suck	179 Summer St.
Boston	John Sullivan	C. E. Riley & Co.
Boston	George C. Tewksbury	Amer. Ship Windlass Co.
Boston	James Thomson	Dwight Mfg. Co.
Boston	James P. Tolman	Samson Cordage Works.
Boston	Edward B. Townsend	Warwick Mills.

Digitized by Google

Boston	Frank H. Underwood	Dodge Mfg. Co.
Boston	Stephen M. Weld	89 State St.
Boston	W. B. Smith Whaley	1012 Tremont Bldg.
Boston	William Whitman	Arlington Mills.
Boston	Franklin D. Williams	Hamilton Mfg. Co.
Brookline	Henry B. Ashton	8 Webster Park.
Chelsea	Augustus T. Clark	American Circular Loom Co.
Chelsea	Eugene Finocchiaro	532 Broadway.
Chicopee	Louis A. Aumann	Dwight Mfg. Co.
Chicopee Falls	M. A. Rawlinson	Chicopee Mfg. Co.
Clinton	George W. Dunn	Lancaster Mills.
Clinton	Amos G. Hosmer	Lancaster Mills.
Clinton	Henry D. Martin	Lancaster Mills.
Clinton	William G. McLoon	Lancaster Mills.
Clinton	Charles H. Richardson	Lancaster Mills.
East Cambridge	Ivers S. Adams	American Net and Twine Co.
East Dedham	Benjamin M. Earl	Merchant Dye Works.
Easthampton	George A. Ayer	West Boylston Co.
Easthampton	G. Arthur Cook	West Boylston Mfg. Co.
Easthampton	John Skinner	West Boylston Mfg. Co.
East Douglas	Winfield S. Schuster	Forestdale Mills.
Fall River	F. S. Akin	Cornell Mills.
Fall River	Henry Ashworth	Ashworth Bros.
Fall River	J. W. Bailey	The Bradford Durfee Textile School.
Fall River	William M. Batt	The Davol Mills.
Fall River	John P. Bodge	Arkwright Mills.
Fall River	Charles N. Borden	Richard Borden Mfg. Co.
Fall River	Jefferson Borden, Jr.	Fall River Bleachery Co.
Fall River	Nathaniel B. Borden	Barnard Manufg. Co.
Fall River	James T. Broadbent	Bradford Durfee Textile School.
Fall River	Isaac A. Brown	Narragansett Mills.
Fall River	Simeon B. Chase	King Philip Mills.
Fall River	John A. Collins	American Linen Co.
Fall River	Thomas D. Covel	The Covel and Osborne Co.
Fall River	Frederick E. Cunneen	Seaconnet Mills.
Fall River	Bradford D. Davol	Barnard Manufg. Co.
Fall River	George Delano	Bourne Mills.
Fall River	Robert D. Douglas	402 Bay St.
Fall River	Frank H. Dwelly	Tecumseh Mills.
Fall River	David H. Dyer	D. H. Dyer & Son.
Fall River	John H. Estes	Cotton Manufacturer.
Fall River	William Evans	Hargraves and Parker Mills.
Fall River	Charles F. Farrar	83 Warren St.
Fall River	John T. Fyans	Fyans, Frazer & Blackway Co.
Fall River	Arthur M. Hamilton	
Fall River	John F. Hamlet	P. O. Box 160.

Digitized by Google

Fall River	Alfred H. Hartley	Oils and Mill Supplies.
Fall River	William Hathaway	Barnard Mfg. Co.
Fall River	William B. Hawes	Yarn Broker.
Fall River	George H. Hills	Davol Mills and Stevens Mfg. Co.
Fall River	John H. Holt	Luther Mfg Co.
Fall River	James B. Kerr	American Thread Co., Kerr Mills.
Fall River	John Kniveton	Bradford Durfee Textile School.
Fall River	Frank A. Le Valley	Tuttle, Hurley & Co.
Fall River	Leontine Lincoln	Seaconnet Mills.
Fall River	Charles B. Luther	Luther Mfg. Co.
Fall River	Alexander Makepeace	Richard Borden Mfg. Co.
Fall River	Arthur H. Mason	Davis Mills.
Fall River	Philip A. Mathewson	King Philip Mills.
Fall River	Thomas McAuliffe	Stevens Manufg. Co.
Fall River	James A. McLane	Davis Mills.
Fall River	William A. Nichols	120 Pine St.
Fall River	Robert Place	Supt. Flint Mills.
Fall River	Joseph H. Potter, Jr.	Durfee Mills.
Fall River	Richard G. Riley	Davol Mills.
Fall River	Harry J. Ricketson	Merchants' Mfg. Co.
Fall River	Benj. H. Roberts	163 Grove St.
Fall River	Charles M. Shove	Granite Mills.
Fall River	W. Frank Shove	Pocassett Mfg. Co.
Fall River	Abbott E. Slade	Laurel Lake Mills.
Fall River	J. C. Smith	Chace Mills.
Fall River	Timothy Sullivan	Stafford Mills.
Fall River	James O. Thompson, Jr.	Wampanoag Mills.
Fall River	Rienzi W. Thurston	Machine Mfr.
Fall River	M. J. Toohey	Mfr. Rope, Twine and Banding.
Fall River	Allison W. Trafford	Mfr. Ring Travelers.
Fall River	Robinson Walmsley	Tecumseh Mills.
Fall River	Frederick E. Waterman	Stafford and Cornell Mills.
Fall River	Joseph Watters	Osborn Mills.
Fall River	Eben C. Willey	Barnaby Mfg. Co.
Fall River	Eugene F. Willey	Globe Yarn Mills.
Fall River	George W. Wright	Shove Mills.
Fisherville	Albert W. Dimick	Fisher Mfg. Co.
Fitchburg	Frederick N. Dillon	D. M. Dillon Steam Boiler Works.
Fitchburg	James C. Eteson	Orswell Mills.
Fitchburg	Ernest L. Hersom	Nockedge Mills.
Fitchburg	George P. Grant, Jr.	Grant Yarn Co.
Fitchburg	W. E. Keach	Grant Yarn Co.
Fitchburg	Arthur H. Lowe	Parkhill Manufg. Co.
Fitchburg	David Lowe	Parkhill Manufg. Co.
Fitchburg	Russell B. Lowe	Parkhill Mfg. Co.
Fitchburg	William F. Morgan	Fitchburg Duck Mills.
Fitchburg	Thomas C. Sheldon	8 School St.

Digitized by Google

Fitchburg	Walter F. Stiles	Orswell Mills.
Fitchburg	Ralph E. Thomson	Parkhill Manufg. Co., Mill C.
Franklin	Harry T. Hayward	Forestdale Mfg. Co.
Franklin	Berry Laycock	Franklin Mills Corp.
Great Barrington	Jno. H. C. Church	Monument Mills.
Griswoldville	Joseph W. Ballard	Griswoldville Mfg. Co.
Hebronville	Walter J. Howland	Hebron Mfg. Co., Hebron Mills.
Holyoke	Samuel M. Green	The American Thread Co.
Holyoke	Ernest Lovering	Lyman Mills.
Holyoke	Willard W. Stearns	Farr Alpaca Co.
Hopedale	Clare H. Draper	Experimental Dept. Draper Co.
Hopedale	Eben S. Draper	Draper Co.
Hopedale	George A. Draper	Draper Co.
Hopedale	George Otis Draper	Draper Co.
Hopedale	William F. Draper	Draper Co.
Hopedale	Frank J. Dutcher	Draper Co.
Housatonic	Theodore Ellis Ramsdell	Monument Mills.
Hyde Park	Calvin H. Lee	Readville Cotton Mills.
Indian Orchard	William C. Godfrey	Indian Orchard Co.
Indian Orchard	Henry C. Spence	Metallic Drawing Roll Co.
Indian Orchard	William M. Stevenson	Hodges Fibre Carpet Co.
Indian Orchard	James Strang	Metallic Drawing Roll Co.
Indian Orchard	William V. Threlfall	Chapman Valve Mfg. Co.
Indian Orchard	R. W. Wight	Indian Orchard Co.
Lancaster	J. C. Bolon	Lancaster Mfg. Co.
Lancaster	Dexter Stevens	Yarn Mills, Lancaster Mills.
Lawrence	James W. Ahmuty	Atlantic Cotton Mills.
Lawrence	Joshua D. Armitage	247 Haverhill St.
Lawrence	Joseph P. Battles	The Textile Mach'y Specialty Co.
Lawrence	Albert W. Brainard	Box 33.
Lawrence	Eugene E. Burnham	252 Lowell St.
Lawrence	G. B. Emmons	Emmons Loom Harness Co.
Lawrence	William D. Hartshorne	Arlington Mills.
Lawrence	Walter M. Hastings	Arlington Mills.
Lawrence	John T. Lord	Pacific Mills.
Lawrence	Alvin S. Lyon	Wood Worsted Mill.
Lawrence	James I. Milliken	Everett Mills.
Lawrence	Walter E. Parker	Pacific Mills.
Lawrence	Robert Redford	Box 28.
Lawrence	Francis H. Silsbee	Pacific Mills.
Lawrence	Walter H. Summersby	Atlantic Cotton Mills.
Lawrence	William D. Twiss	Everett Mills.
Lawrence	William S. Whitney	American Woolen Co.
Linwood	Amos G. Maddox	Linwood Cotton Mill.
Lowell	George E. Ames	Lawrence Manufg. Co.
Lowell	Harry Gage Baker	Lowell Machine Shop and Kitson Machine Shop.

Digitized by Google

Lowell	Charles Ray Blake	Tremont and Suffolk Mills.
Lowell	Norman E. Borden	Lowell Weaving Co.
Lowell	Frank A. Bowen	Appleton Co.
Lowell	Edward N. Burke	Lowell Machine Shop.
Lowell	Paul Butler	Whittier Mills.
Lowell	W. W. Carey	Wood Rim Pulleys and Wood Working Machinery.
Lowell	Alfred M. Chadwick	Tremont and Suffolk Mills.
Lowell	Clarence N. Childs	Hamilton Mfg. Co.
Lowell	Avery B. Clark	Merrimack Mfg. Co.
Lowell	John J. Connell	Tremont and Suffolk Mills.
Lowell	A. G. Cumnock	Appleton Co.
Lowell	Joseph L. Cushing	Daniel Cushing & Co.
Lowell	Albert Deabill	Lowell Hosiery Co.
Lowell	Edward P. Dennis	50 Chelmsford St.
Lowell	John H. Dunn	Tremont & Suffolk Mills.
Lowell	Charles H. Eames	Lowell Textile School.
Lowell	Wm. Kendall Fairbanks	Bigelow Carpet Co.
Lowell	John W. Foster	Hamilton Mfg. Co.
Lowell	Royal W. Gates	Josiah Gates & Sons.
Lowell	Percy Gulline	Merrimack Print Works.
Lowell	Walter B. Hall	Hamilton Mfg. Co.
Lowell	William E. Hall	Shaw Stocking Co.
Lowell	Charles C. Hedrick	Lowell Machine Shop.
Lowell	P. T. Jackson, Jr.	Lowell Weaving Co.
Lowell	Nelson D. Keables	Mass. Cotton Mills.
Lowell	Frank B. Kenney	T. C. Entwistle Co.
Lowell	Fred Lacey	Boott Mills.
Lowell	Charles F. Libby	Shaw Stocking Co.
Lowell	Charles E. Meader	Lowell Bleachery.
Lowell	William A. Mitchell	Mass. Cotton Mills.
Lowell	Albert H. Morton	Lowell Machine Shop.
Lowell	Will Nelson	Lowell Textile School.
Lowell	Franklin Nourse	Lawrence Manufg. Co.
Lowell	Louis Atwell Olney	Lowell Textile School.
Lowell	John W. Pead	1072 Bridge St.
Lowell	Haven C. Perham	Kitson Machine Co.
Lowell	Thomas Perkins, Jr.	Tremont and Suffolk Mills.
Lowell	Victor H. Pihl	Boott Mills.
Lowell	John J. Rooney	Tremont & Suffolk Mills.
Lowell	Frederick P. Shaw	Shaw Machine Co.
Lowell	Robert A. Smith	Mass. Cotton Mills.
Lowell	Stephen E. Smith	Lowell Textile School.
Lowell	William S. Southworth	Mass. Cotton Mills.
Lowell	John A. Stevens	Merrimack Mfg. Co.
Lowell	Earl A. Thissell	Lowell Hosiery Co.
Lowell	Ariel C. Thomas	Boott Cotton Mills.

Digitized by Google

Lowell	Charles T. Upton	63 Mt. Vernon St.
Lowell	Fenwick Umpleby	Lowell Textile School.
Lowell	Jude C. Wadleigh	Merrimack Mfg. Co.
Lowell	Frederick T. Walsh	Thomas Leyland & Co.
Lowell	Walter S. Watson	Haworth & Watson.
Lowell	Channing Whitaker	Lowell Machine Shop.
Lowell	John K. Whittier	Kitson Machine Shop.
Lynn	John H. Nelson	Wm. Firth Co.
Lynn	Richard H. Rice	Gen. Elec. Co.
Lynn	Henry B. Sprague	Boston Woven Hose and Rubber Co.
Lynn	C. J. H. Woodbury	51 Baltimore St.
Manchaug	T. B. Stevenson	Manchaug Co.
Melrose	George E. Prest	9 Russell St.
Melrose	John E. Prest	9 Russell St.
Methuen	Lewis E. Barnes	Pemberton Co. and Methuen Co.
Methuen	John H. Binns	Arlington Mills.
Methuen	Alfred C. Gaunt	Tremont Worsted Co.
Methuen	Alfred Sagar	Arlington Cotton Mills.
Milford	Wallace I. Stimpson	16 Church St.
Millbury	Fred W. Moore	Cordis Mills.
Millbury	Francis H. Rice	Holbrook Mfg. Co.
New Bedford	George H. Booth	Gosnold Mill.
New Bedford	Charles A. Bowen	S. C. Lowe Supply Co.
New Bedford	Christopher P. Brooks	International Correspondence School
New Bedford	William A. Congdon	Whitman Mills.
New Bedford	Richard Cowell	290 Summer St.
New Bedford	William W. Crapo	Wamsutta Mills.
New Bedford	Mark B. Creed	Wamsutta Mills.
New Bedford	Andrew J. Currier	Nonquitt Spinning Co.
New Bedford	Charles Owen Dexter	Beacon Mfg. Co.
New Bedford	John A. Fernley	Butler Mill.
New Bedford	Arnold C. Gardner	Manomet Mills.
New Bedford	William Edwin Hatch	New Bedford Textile School.
New Bedford	William C. Hawes	Taber Mill.
New Bedford	Hiram Higham	Wamsutta Mills.
New Bedford	Clark W. Holcomb	Old Colony Mills, Taunton.
New Bedford	Charles M. Holmes	Box 96.
New Bedford	Leonard Johnson	Page Mfg. Co.
New Bedford	Nathaniel B. Kerr	Butler Mill.
New Bedford	John W. Knowles	Page Mfg. Co.
New Bedford	Walter H. Langshaw	Dartmouth Manufg. Corp.
New Bedford	Leonard C. Lapham	Nonquitt Spinning Co.
New Bedford	John H. Lawrence	Top Roll Mfg.
New Bedford	Frederick B. Macy	Soule Mills.
New Bedford	John McCullough	Cotton Waste Merchant.
New Bedford	Robert P. McEwen	Lambeth Rope Corp.

Digitized by Google

New Bedford	Albert D. Milliken	New England Cotton Yarn Co.
New Bedford	John Neild	Grinnell Mfg. Corp.
New Bedford	H. W. Nichols	New Bedford Textile School.
New Bedford	Walter H Paige	Wamsutta Mills.
New Bedford	Albert R. Pierce	Pierce Mfg. Corp.
New Bedford	Andrew G. Pierce, Jr.	Pierce Mfg. Corp.
New Bedford	Frederick W. Reynolds	Potomska Mills.
New Bedford	Robert Schofield	N. E. Cotton Yarn Co.
New Bedford	Edwin G. Shepardson	Kilburn Mill.
New Bedford	Lewis T. Shurtleff	Pairpoint Corp.
New Bedford	Abbott P. Smith	Soule, Butler and Kilburn Mills.
New Bedford	Rufus A. Soule	Soule Mills.
New Bedford	Rufus A. Soule, Jr.	Taber Mill.
New Bedford	Thomas Stone	Taber Mills.
New Bedford	John B. Strongman	Gosnold Mill Co.
New Bedford	William C. Taber	Whitman Mills and Beacon Mfg. Co.
New Bedford	Frederic Taber	Taber Mill.
New Bedford	Samuel Taylor	Soule Mill.
New Bedford	Herbert E. Walmsley	Wamsutta Mills.
New Bedford	Lettice R. Washburn	235 North Water St.
New Bedford	William R. West	830 Purchase St.
New Bedford	Benjamin Wilcox	Bennett Mill.
New Bedford	Eugene F. Willey	Bennett and Columbia Mills.
New Bedford	George A. Wilson	Whitman Mills.
New Bedford	Samuel F. Winsper	N. E. Cotton Yarn Co.
Newburyport	Lewis Dexter, Jr.	Warner Cotton Mills.
Newburyport	John Gregson	Peabody Mfg. Co.
Newton	Josiah G. Coburn	99 Washington St.
Newtonville	Oscar B. Truesdell	18 Washington Terrace.
Newton Upper Falls	Frank J. Hale	Saco and Pettee Machine Shops.
Newton Upper Falls	R. Paul Snelling	Saco and Pettee Machine Shops.
North Adams	William K. Greer	Eclipse & Beaver Mills.
North Adams	Hervey Burnham	Beaver Mills and Eclipse Mill.
Northampton	Charles E. Childs	West Boylston Mfg. Co.
Northbridge	Earl S. Jenckes	Paul Whitin Mfg. Co.
Northbridge	Henry T. Whitin	Paul Whitin Manufg. Co.
Northbridge	Paul Whitin	Paul Whitin Mfg. Co.
North Brookfield	W. Marshall Taylor	Indian Orchard Flax Co.
North Oxford	Edwin N. Bartlett	Edwin Bartlett Co.
North Plymouth	Gideon F. Holmes	Plymouth Cordage Co.
North Uxbridge	Fred B. Whitin	Uxbridge Cotton Mills.
Norwood	Henry W. Stone	Holliston Mills.
Pittsfield	Merton J. Wilmarth	J. L. & T. D. Peck Mfg. Co.
Readville	George P. Erhard	The Stafford Co.
Readville	Rowland N. Mackay	The Stafford Co.
Readville	Fred A. Wilde	Geo. W. Stafford Co.
Salem	Orin F. Bennett	Naumkeag Steam Cotton Co.

Digitized by Google

Salem	C. F. Curwen	Dinsmore Mfg. Co.
Salem	William P. McMullan	Naumkeag Steam Cotton Co.
Salem	Henry Osgood	P. O. Box 204.
Salem	Nathaniel G. Simonds	Naumkeag Steam Cotton Co.
Saundersville	Hiram L. Reynolds	Saunders Cotton Mills.
Shattuckville	Frank S. Field	Massaemit Yarn Mills.
Shirley	Newton Wilson	Samson Cordage Works.
Somerville	Albert Birch	Birch Bros. Co.
Somerville	George Crompton	Middlesex Bleachery.
South Boston	Robert Bishop	Robert Bishop Mfg. Co.
South Boston	W. L. Draper	253 A St.
Southbridge	Calvin D. Paige	Central Mills.
South Framingham	Bernard F. Merriam	Cordaville Woolen Co.
South Hadley Falls	Charles W. Dennett	So. Hadley Mills.
South Hadley Falls	Harlan Ingalls Dennett	Hadley Mills.
Spring Hill	Justin A. Ware	
Taunton	Raymond D. Borden	Watuppa Mills.
Taunton	Peter H. Corr	Greenwich Bleachery.
Taunton	Thomas G. Cox	Mason Machine Works.
Taunton	H. H. Culver	Elizabeth Poole Mills.
Taunton	Henry S. Culver	Westville Cotton Mills.
Taunton	S. L. Gabriel	U. S. Linen Co.
Taunton	Henry M. Lovering	Whittenton Manufg. Co.
Taunton	William M. Lovering	
Taunton	Charles L. Macomber	Winthrop Cotton Yarn Co.
Taunton	John Tempest Meats	Mason Machine Works.
Taunton	Herbert H. Shumway	
Taunton	Henry Williams	Canoe River Mill.
Taunton	Elias S. Willis	N. E. Cotton Yarn Co.
Thorndike	Charles A. Tabor	Thorndike Co.
Three Rivers	Roscius C. Newell	Otis Co.
Three Rivers	Frederick A. Upham	Palmer Mill, Otis Co.
Turners Falls	Samuel L. Parker	Turners Falls Cotton Mills.
Waltham	Charles E. Getchell	Waltham Emery Wheel Co.
Waltham	Arthur H. Paul	Boston Mfg. Co.
Ware	George E. Tucker	The Otis Co.
Webster	Frank Hartley	S. Slater & Sons.
Webster	E. P. Morton	Stevens Linen Works.
Webster	Frank Porter, Jr.	
Webster	William J. Stewart	S. Slater & Sons Inc.
Westboro	Walter C. Metcalf	Cordaville Woolen Co.
Westfield	E. T. Fowler	Foster Machine Co.
Westfield	W. H. Jillson	Mfr. Cotton Yarns.
West Warren	A. G. Harris	West Warren Cotton Mills.
West Warren	William P. Holt	
Whitinsville	Alfred E. Adams	Whitinsville Cotton Mills and Linwood Mills.

Digitized by Google

Whitinsville	Melvin H. Coffin	Whitin Machine Works.
Whitinsville	James A. Cooper	Whitin Machine Works.
Whitinsville	George B. Hamblin	Whitin Machine Works.
Whitinsville	Lawrence M. Keeler	Whitin Machine Works.
Whitinsville	Josiah M. Lasell	Whitin Machine Works.
Whitinsville	E. Kent Swift	Whitin Machine Works.
Whitinsville	Oscar L. Owen	Whitin Machine Works.
Whitinsville	Elwin H. Rooney	The Whitin Machine Works.
Whitinsville	Arthur F. Whitin	Saunders Cotton Mills.
Whitinsville	G. Marston Whitin	Whitin Machine Works.
Whitinsville	James Earle Whitin	Uxbridge Cotton Mills.
Williamstown Sta.	Roland R. Kelly	Williamstown Manufg. Co.
Woburn	William W. Crosby	8 Court St.
Worcester	George L. Brownell	Inventor and Builder of Improved Twisting Machinery.
Worcester	George Crompton	Crompton-Thayer Loom Co.
Worcester	Randolph Crompton	Crompton-Thayer Loom Co.
Worcester	Henry F. Harris	W. Boylston Mfg. Co.
Worcester	Lewis T. Houghton	89 Exchange St.
Worcester	A. H. Howard	Howard Bros. Mfg. Co.
Worcester	C. H. Hutchins	Crompton & Knowles Loom Works.
Worcester	Edwin H. Marble	Curtis & Marble Machine Co.
Worcester	Edwin T. Marble	Curtis & Marble Machine Co.
Worcester	Geo. I. Rockwood	62 Summer St.
Worcester	Harry M. Smith	
Worcester	Gay D. Thayer	Crompton & Knowles Loom Works.
Worcester	W. W. White	Holyoke Machine Co.

RHODE ISLAND.

Albion	Arnold B. Chace	Valley Falls Co.
Alton	Charles W. Shepard	Alton Mfg. Co.
Allenton	R. A. Gray	Rodman Manufg. Co.
Anthony	Frank F. Woolley	Coventry Co.
Ashton	Charles H. Collins	Berkeley Co.
Ashton	Robert Stewart	Lonsdale Co.
Bristol	Ezra Dixon	Dixon Lubricating Saddle Co.
Central Falls	Louis B. Barker	United States Cotton Co.
Central Falls	David Grove	United States Cotton Co.
Central Falls	B. F. G. Linnell	Yarns, Threads and Twines.
Centreville	James T. Ferguson	Warwick Mills.
Crompton	Charles D. Robinson	Crompton Co.
East Greenwich	H. M. Peirce	Greenwich Bleachery.
Enfield	Harold C. Whitman	Esmond Mills.
Fiskville	James Gee	Interlaken Dye Works.
Forestdale	William B. Orr	Forestdale Mfg. Co.

Digitized by Google

Forestdale	Alphonso F. White	Forestdale Mfg. Co.
Georgiaville	A. E. Bosworth	Bernon Mills.
Hamilton	Joseph Warren Greene	Hamilton Web Co.
Longmeadow	Abel T. Atherton	Machine Maker.
Lonsdale	Edward A. Mongeon	Lonsdale Mills.
Lonsdale	R. Irving Tobey	
Manville	A. Tenny White	Manville Co.
Natick	Andrew W. McAllister	
Natick	John G. McFadden	Natick Mills.
Olneyville	Arthur Parkinson	Royal Chemical Co.
Pawtucket	G. Bion Allen	J. & P. Coats, Ltd.
Pawtucket	V. T. Barber	Slater Cotton Co.
Pawtucket	Harold C. Barnefield	Hays Textile Co.
Pawtucket	Louis W. Bishop	Blackstone Webbing Co.
Pawtucket	William Washington Blades	Lorraine Mfg. Co.
Pawtucket	E. R. Bullock	J. & P. Coats, Ltd.
Pawtucket	Robert Burgess	Burgess Mills.
Pawtucket	Benjamin C. Chace, Jr.	Jenckes Spinning Co.
Pawtucket	Alfred L. Clark	Greene & Daniels Mfg. Co.
Pawtucket	Amos Crankshaw	Lorraine Mfg. Co.
Pawtucket	John Crowther	Shannock Narrow Fabric Co.
Pawtucket	William P. Dempsey	Dempsey Bleachery & Dye Works.
Pawtucket	Henry C. Dexter	Greene & Daniels Mfg. Co.
Pawtucket	Robert Dow	Solway Dyeing & Textile Co.
Pawtucket	Fred W. Easton	Easton & Burnham Machine Co.
Pawtucket	D. A. Everly	Cotton Mfr.
Pawtucket	Arthur H. Goff	D. Goff & Son.
Pawtucket	Lyman B. Goff	Union Wadding Co.
Pawtucket	William Halliwell	Ingrahamville Dye Works.
Pawtucket	Charles E. Harrison	Harrison Yarn and Dyeing Co.
Pawtucket	Elisha H. Howard	Slater Cotton Co.
Pawtucket	Frederick L. Jenckes	Jenckes Spinning Co.
Pawtucket	J. E. Jenckes	The E. Jenckes Manufg. Co.
Pawtucket	Albert A. Jenks	Fales & Jenks Machine Co.
Pawtucket	John T. Kirk	Slater Cotton Co.
Pawtucket	William A. Lehan	Burgess Mills.
Pawtucket	James R. MacColl	Lorraine Manufg. Co.
Pawtucket	Edward L. Martin	Howard & Bullough Am. Machine Co.
Pawtucket	Frederick R. Mason	The Robert D. Mason Co.
Pawtucket	Edward J. McCaughey	Home Bleach & Dye Works.
Pawtucket	George A. Moody	206 Fountain St.
Pawtucket	James C. Potter	Potter & Johnson Co.
Pawtucket	Charles O. Read	Sayles' Bleacheries, and Glenlyon Dye Works.
Pawtucket	E. R. Richardson	Howard & Bullough American Machine Co., Ltd.

Digitized by Google

Pawtucket	Israel P. Rounds	Naushon Co.
Pawtucket	Frank A. Sayles	Sayles Bleacheries & Lorraine Mfg. Co.
Pawtucket	Dwight Seabury	12 East Ave.
Pawtucket	Charles S. Smith	Smith Webbing Co.
Pawtucket	W. H. Smith	American Textile Co.
Pawtucket	Jacob Stephans	William H. Haskell Mfg. Co.
Pawtucket	Edward Thayer	Lebanon Mill Co.
Pawtucket	S. Willard Thayer	Dexter Yarn Co.
Pawtucket	William P. Wood	Royal Weaving Co.
Peace Dale	William C. Greene	Peace Dale Manufg. Co.
Phenix	Henry R. Brown	Phenix Mill.
Phenix	Robert Reoch	Cranston Print Works Co.
Pontiac	Charles E. Thomas	
Providence	Charles T. Aldrich	Aldrich Manufg. Co.
Providence	John Ormsbee Ames	Fletcher Mfg. Co.
Providence	William Ames	Fletcher Mfg. Co.
Providence	George R. Babbitt	American Oil Co.
Providence	Edward R. Ballou	Ballou Yarn Co.
Providence	Edward R. Blanchard	Glenlyon Dye Works.
Providence	Joseph W. Booth	Atlantic Mills.
Providence	Arthur F. Brackett	10 Oakland Ave.
Providence	J. Frank Braids	Charles S. Bush Co.
Providence	H. Martin Brown	U. S. Bobbin & Shuttle Co.
Providence	E. C. Bucklin	Interlaken Mills.
Providence	Harris H. Bucklin	Interlaken Mills.
Providence	Granville R. Budlong	Union Wadding Co.
Providence	Charles H. Child	Standard Mill Supply Co.
Providence	Alfred M. Coats	J. & P. Coats, L't'd.
Providence	Frederick I. Dana	The Textile Machinery Finishing Co.
Providence	A. Lockwood Danielson	Quinebaug Co.
Providence	J. DeForest Danielson	Lockwood Co. and Lewiston Bleachery and Dye Works.
Providence	John W. Danielson	Lockwood Co., Ponemah Mills, Quinebaug Co., Wauregan Co., & Lewiston Bleachery & Dye Works.
Providence	Henry B. Deming	Deming Braiding Co.
Providence	Arthur W. Dennis	Elmwood Mills.
Providence	Jesse P. Eddy, Jr.	Tillinghast Stiles Co. and Fitch Mfg. Co.
Providence	F. C. Fletcher	Lawton Spinning Co.
Providence	J. Herbert Foster	10 South Water St.
Providence	Arthur C. Freeman	Textile Finishing Machinery Co.
Providence	William Gammell	Berkeley Co.
Providence	R. H. I. Goddard, Jr.	Goddard Bros.
Providence	Rufus B. Goff	Standard Mill Supply Co.

Digitized by Google

Providence	Russell Grinnell	General Fire Extinguisher Co.
Providence	John H. Hambly	Quidnick Mfg. Co.
Providence	A. Walter Harris	A. W. Harris Oil Co.
Providence	Jeffrey Hazard	Hazard Cotton Co.
Providence	Alexander F. Hobbs	U. S. Finishing Co.
Providence	Frederic W. Howe	Crompton & Knowles Loom Works.
Providence	Albert C. Hoy	Grosvenor Dale Co.
Providence	Daniel Jackson	B. B. & R. Knight.
Providence	John E. Kendrick	American Supply Co.
Providence	Albert F. Knight	1149 Elmwood Ave.
Providence	Stephen A. Knight	Hebron Manufg. Co.
Providence	Webster Knight	B. B. & R. Knight's Mills.
Providence	W. C. Langford	14 Peck St.
Providence	Henry F. Lippitt	Social and Manville Cos.
Providence	Charles R. Makepeace	Box 973.
Providence	Henry W. Mason	10 South Water St.
Providence	F. H. Maynard	Gen. Fire Extinguisher Co.
Providence	Charles H. Merriman, Jr.	Manville Co.
Providence	W. C. Murphy	Union Hardware & Electric Supply Co.
Providence	William C. Peirce	Elizabeth Mills.
Providence	Charles A. M. Praray	Chas. A. M. Praray & Co.
Providence	E. A. Rusden	17 Exchange Place.
Providence	Robert Schaellibaum	Rob. Schaellibaum Co.
Providence	Arthur N. Sheldon	F. P. Sheldon & Co.
Providence	Frank P. Sheldon	Industrial Trust Building.
Providence	Antonio Spencer	Spencer Yarn Co.
Providence	Wilton H. Spencer	7 Exchange Place.
Providence	Robert W. Taft	Coventry Co.
Providence	Charles F. Taylor	Burgess Cop Tube Co.
Providence	James T. Thornton	Thornton Machinery Co.
Providence	A. Curtis Tingley	National Ring Traveler Co.
Providence	W. O. Todd	Lawton Spinning Co.
Providence	Robert B. Treat	Manufacturers' Fuel Co.
Providence	Fred Unger	48 Central St.
Providence	William P. Vaughan	Putnam Mfg. Co.
Quidnick	Alton L. R. Hambly	Quidnick Mfg. Co.
Quidnick	O. B. Parker	Quidnick Mfg. Co.
Riverpoint	O. D. Drew	Valley Queen & Arctic Mills.
Saylesville	Charles F. Burnham	Crefeld Waste and Batting Co., and The L. A. Lockwood Co.
Saylesville	Stewart F. Carter	Glenlyon Dye Works.
Saylesville	L. A. Lockwood	Crefeld Waste and Batting Co., and The L. A. Lockwood Co.
Saylesville	Charles M. Perry	Glenlyon Dye Works.
Sayesville	Kenneth F. Wood	Sayles Bleacheries.
Valley Falls	Malcolm G. Chace	Naushon Mfg. Co.

Digitized by Google

Valley Falls	Edward B. Jennings	Samoset Co.
Warren	Edward E. Bartlett	Parker Mills.
Warren	Arnold Schaer	Warren Manufg. Co.
Westerly	William Clark	Wm. Clark Mills, American Thread Co
Westerly	Alexander King, Jr.	Amer. Thread Co.
Westerly	Robert B. Meikle	Lorraine Mfg. Co.
Westerly	Harry Tunstall	American Thread Co.
Woonsocket	L. W. Campbell	Woonsocket Machine and Press Co.
Woonsocket	Malcolm Campbell	Woonsocket Mach. & Press Co.
Woonsocket	Harry S. Greene	Woonsocket Napping Machinery Co.
Woonsocket	Henry S. Greene	Woonsocket Napping Machinery Co.
Woonsocket	Edmond H. Guerin	American Paper Tube Co.
Woonsocket	William Halliwell	Providence and Woonsocket Mills of the Lawton Spinning Co.
Woonsocket	Edward W. Houghton	Globe Mill, Manville Co.
Woonsocket	Henry S. Houghton, Jr.	Anchor Webbing Co.
Woonsocket	Henry S. Houghton, Sr.	74 Hamlet Ave.
Woonsocket	William N. Kimball	Social and Nourse Mills.
Woonsocket	Hadley D. Perkins	Bellingham Handkerchief Mfg. Co.
Woonsocket	Joseph G. Ray	The Putman Mfg. Co.
Woonsocket	Marcus J. Woodrow	Clinton Mfg. Co.

CONNECTICUT.

Baltic	Samuel T. Butterworth	Baltic Mills Co.
Baltic	William E. Peck	The Baltic Mills Co.
Danielson	W. Irving Bullard	E. H. Jacobs Mfg. Co.
Danielson	Gordon A. Johnstone	Danielson Cotton Co.
Danielson	James Herbert Smith	Quinebaug Co.
Jewett City	Frederick D. Ballou	W. A. Slater Mills.
Jewett City	James O. Sweet	Ashland Cotton Co.
Jewett City	Adelbert R. Young	Ashland Cotton Co.
Killingly	H. C. Atwood	Williamsville Manufg. Co.
Killingly	W. E. Atwood	Williamsville Manufg. Co.
Killingly	Ernest E. Clark	Williamsville Mfg. Co.
Killingly	C. H. Truesdell	Attawaugan Co.
Middletown	Benjamin Forster	71 Spring St.
Middletown	Frank B. Gustafson	I. E. Palmer Cotton Spinning Mill.
Middletown	Maylin Hamburger	
Middletown	Joseph Merriam	Springfield Webbing Co.
Middletown	J. F. Powers	Spinning Mill.
Montville	W. G. Hartford	Monarch Woolen Mills.
Montville	W. S. Trickett	Attawaugan Co.
Moosup	L. B. Cranska	Floyd Cranska Mills.
Mystic	A. E. Henry	
New Haven	George S. Barnum	The Bigelow Co.

Digitized by Google

Norwich	W. N. Blackstone	Attawaugan Co. and Totokett Mills Co.
Norwich	W. R. Burnham	362 Main St.
Norwich	C. H. Frisbie	Attawaugan Co. Arista Mills Co.
Norwich	W. G. Henderson	Falls Co.
Norwich	Wm. I. Woodward	Shetucket Co.
Norwich Town	Arthur H. Gulliver	P. O. Box 37.
Plainfield	Harold Lawton	The Lawton Mills Corp.
Putnam	George W. Holt	Monohansett Manufg. Co.
Putnam	George A. Vaughan	Putnam Manufg. Co.
Sterling	Harold Mowry	Br. U. S. Finishing Co.
Taftville	Joseph D. Aiken	Ponemah Mills.
Taftville	John Eccles	Ponemah Mills.
Uncasville	Robert G. McMeehan	Uncasville Mfg. Co.
Versailles	Charles W. Perkins	The Totokett Mfg. Co.
Voluntown	George T. Briggs	The Briggs Mfg. Co.
Waterbury	Archer J. Smith	The American Mills Co.
Wauregan	James A. Atwood	Wauregan Co. & Quinebaug Co.
Wauregan	John Walter Atwood	Wauregan Co.
Willimantic	Dickerson G. Baker	American Thread Co.
Willimantic	E. S. Boss	American Thread Co.
Willimantic	John L. Burton	Willimantic Cotton Mills.
Willimantic	Peter Hardman	American Thread Co., Willimantic Mills.
Willimantic	Walter B. Knight	Windham Mfg. Co.
Willimantic	Joseph Mercer	Willimantic Cotton Mills Co.
Windsor Locks	George M. Montgomery	The J. R. Montgomery Co.
Windsor Locks	J. R. Montgomery	The J. R. Montgomery Co.

NEW YORK.

Brooklyn	Hugh De Haven	De Haven Mfg. Co.
Capron	W. H. Cloher, Jr.	Utica Cotton Co.
Chadwicks	Bradford C. Divine	Utica Willowvale Bleaching Co.
Cohoes	David S. Johnston	Harmony Mills.
Cohoes	Henry C. Phillips	Harmony Mills.
Cohoes	William H. Robinson	No. 3 Harmony Mill.
Elmira	William H. Bilbrough	Elmira Knitting Mills and Conewawah Spinning Co.
Jamestown	Thomas Henry Smith	Jamestown Cotton Mill.
Newburgh	William J. Hadfield	Harrison & Gore Silk Mills.
New York City	Robert Franklin Adams	106 Grand St.
New York City	George Arms	Grand Hotel.
New York City	Edwin H. Baker	Bliss, Fabyan & Co.
New York City	D. C. Ball	5 Beekman St.
New York City	Percy H. Brundage	49 Wall St.

Digitized by Google

New York City	Albert C. Case	5 Nassau St.
New York City	Charles F. Chase	Cling Surface Co. of Buffalo.
New York City	J. E. Cheesman	Cheesman Cotton Gin Co.
New York City	C. C. Cowan	82 Wall St.
New York City	E. C. Foerster	415 Broadway.
New York City	Charles M. Heminway	Consolidated Engine Stop Co.
New York City	Samuel T. Hubbard	Hubbard Bros. & Co.
New York City	Arthur B. Mann	J. H. Martin & Co.
New York City	John R. Mitchell	Mitchell-Bissell Co.
New York City	Fred Moss	495 Broome St.
New York City	Hugh Nelson	Casualty Co. of America.
New York City	Charles H. Newman	Webster Mfg. Co.
New York City	Chas. F. Pray	Cloth Broker.
New York City	Theodore H. Price	Cotton Dealer.
New York City	John Bion Richards	
New York City	William N. Shaw	The Lincoln Iron Works & Jackson Architectural Iron Works.
New York City	H. Cowles Smith	Acme Flexible Clasp Co.
New York City	Daniel J. Sully	
New York City	Ridley Watts	Grinnell, Willis & Co.
New York City	Clarence Whitman	Wilkesbarre Lace Mfg. Co.
New York City	Arthur Whittam	James E. Mitchell Co.
New York City	George A. Wies	Eureka Fire Hose Co.
New York City	Thomas Winn	The Arabol Mfg. Co.
New York Mills	Obadiah Butler	New York Mills.
New York Mills, Oneida Co.,	J. B. Bolton	New York Mills.
New York Mills, Oneida Co.,	John P. Campbell,	New York Mills.
New York Mills, Oneida Co.,	Lavater W. Powers,	New York Mills.
Oswego	George E. Farrell	Ontario Knitting Co.
Oswego	James G. Merriman, Jr.	Standard Spinning Co.
Perry	Robert A. Copeland	Perry Knitting Co.
Perry	George M. Traber	The Perry Knitting Co.
Rochester	Lewis H. Russell	16 Cambridge St.
Sloatsburg	Allan A. Freeman	Atlantic Fibre Co.
St. Johnsville	J. H. Reaney	Royal Gem Mills Co.
Troy	James W. Taylor	Troy Knitting Co.
Utica	John W. Allis	Utica Knitting Co.
Utica	R. Bloss Billings	Utica Dyeing Co.
Utica	John A. Crossland	Skenandoa Cotton Co.
Utica	George DeForest	Utica Steam and Mohawk Valley Cotton Mills.
Utica	James B. Duggan	41 Jewett Place.
Utica	D. W. Gray	Manager La Tosca Spinning Co.
Utica	Charles Hayes, Jr.	Skenandoa Cotton Co.
Utica	Henry F. Mansfield	Utica Steam Cotton Mills and Mohawk Valley Cotton Mills.

Digitized by Google

Utica	John E. McLaughlin	La Tosca Yarn Mill.
Utica	R. P. McLoughlin	La Tosca Yarn Mill.
Utica	Pardon B. Sanford	Utica Knitting Co.
Utica	Albion K. Searls	Oneita Knitting Mills.
Utica	John B. Wild	Oneita Knitting Mills.
Utica	Rex G. Witherbee	Utica Steam and Mohawk Valley Cotton Mills.
Victory Mills	J. Potter Harrington	Saratoga Victory Mills.

NEW JERSEY.

Atlantic City	Franklin P. Stoy	817 Pacific Ave.
Beverly	Alban Spooner	Beverly Underwear Co.
East Newark	Halsey Connett	Clark Mile End Spool Cotton Co.
East Newark	Adam H. Groel	Clark Mile End Spool Cotton Co.
Gloucester City	George W. Grove	Argo Mills Co.
Gloucester City	Jesse A. Knight	Argo Mills Co.
Gloucester City	George W. Turner	Argo Mills Co.
Jersey City	Ernest Bridge	Jas. Chadwick & Bro. Ltd.
Jersey City	Maxwell Grierson	Jas. Chadwick & Bro., Ltd.
Jersey City	B. L. Stowe	Eureka Fire Hose Co.
Millville	John F. Reardon	Millville Mfg. Co.
Newark	James H. Abercrombie	Clark Thread Co.
Newark	William H. Loftus	Clark Thread Co.
New Brunswick	William Henry Hobbs	The Red Cross Cotton Mills.
Passaic	William L. Lyall	Brighton Mills.
Paterson	J. E. Barbour	Barbour Flax Spinning Co.
Paterson	John W. Ferguson	Paterson Nat. Bank Bldg.
Trenton	Edward C. Stokes	

PENNSYLVANIA.

Chester	William S. Blakeley	Arashapa Co.
Chester	John W. France	The Aberfoyle Mfg. Co.
Chester	W. T. Galey	Aberfoyle Manufg. Co.
Chester	D. Edwin Irving	The Irving & Leiper Manufg. Co.
Chester	Robert F. Kineavy	Arasapha Mfg. Co.
Chester	John William Smith	T. I. Birkin & Co.
Chester	D. Irving Trainer	Lincoln Mfg. Co.
East Pittsburg	Charles Robbins	Westinghouse Electric & Mfg. Co.
Frankford, Phila.	Walter R. Garsed	Wingohocking Cotton Mills.
Lancaster	George E. Zellers	John Farnum & Co.
Mt. Joy	Thomas J. Brown	George Brown's Sons.
Philadelphia	Bradley C. Algeo	Philadelphia Textile School.

Digitized by Google

Philadelphia	Robert Beatty	Robt. Beatty & Co.
Philadelphia	Robert C. Blood	7th and Somerset Sts.
Philadelphia	T. Ashby Blythe	Ashby Cotton Mills.
Philadelphia	Edward Bromley	John Bromley & Sons.
Philadelphia	Joseph H. Bromley	Fourth and Lehigh Ave.
Philadelphia	Alfred H. Burnham	Glasgow Mills.
Philadelphia	Harry W. Butterworth	H. W. Butterworth & Sons.
Philadelphia	James Butterworth	H. W. Butterworth & Sons.
Philadelphia	E. G. Chester	Cedar and Huntingdon Sts.
Philadelphia	H. M. Daniel	The Mayo Mills and The Avalon Mills.
Philadelphia	Frederick A. Downes	Keystone Mutual Fire Insurance Co.
Philadelphia	Edward W. France	Philadelphia Textile School.
Philadelphia	Simon Friedberger	Friedberger Mfg. Co.
Philadelphia	Otto Goetze	Glasgow Mills, Kensington Station.
Philadelphia	John T. Greenwood	R. Greenwood & Bault.
Philadelphia	Henry S. Grove	Argo Mills Co.
Philadelphia	James Henry	Thomas Henry & Sons.
Philadelphia	William G. Henry	Thomas Henry & Sons.
Philadelphia	Robert P. Hooper	Hooper Sons Mfg. Co.
Philadelphia	W. C. Houston	Hope Mills Mfg. Co.
Philadelphia	Oliver N. Long	Long Bros. Co.
Philadelphia	John H. Lorimer	Ontario and Lawrence Sts.
Philadelphia	J. Franklin McFadden	George H. McFadden & Bro.
Philadelphia	David H. McKinley	Philadelphia Thread Co.
Philadelphia	Simon Miller	16th & Reed Sts.
Philadelphia	David Milne	Washington Ave and 10th & 11th Sts.
Philadelphia	Edward H. Sanborn	Cold Spring Bleach. & Fin. Works.
Philadelphia	Albert E. Schofield	Delph Spinning Co.
Philadelphia	W. A. Spellissy	Jenckes Spinning Co.
Philadelphia	Paul E. Sutro	E. Sutro & Son.
Philadelphia	William L. Turner	North American Lace Co.
Philadelphia	Joseph Wasserman	Philadelphia Tapestry Mills.
Philadelphia	William T. Westerman	Ontario Spinning Co.
Philadelphia	James S. Whitaker	William Whitaker & Sons.
Philadelphia	E. Wilkinson, Jr.	E. Wilkinson & Son.
Philadelphia	George Wood	Millville Mfg. Co.
Philadelphia	John P. Wood	521 N. 22nd St.
Philadelphia	Oscar W. Wood	Germantown Spinning Co.
Pittsburg	Roland Gerry	Jones & Laughlin Steel Co.
South Bethlehem	Frederick Ott	Lehigh Valley Silk Mills.
Yardley	Theodore C. Search	Cold Spring Bleaching and Finishing Works.

DELAWARE.

Wilmington	Daniel Moore Bates	Joseph Bancroft & Sons Co.
Wilmington	John B. Bird	Joseph Bancroft & Sons Co.

Digitized by Google

MARYLAND.

Baltimore	E. Stanley Gary	Gary Mfg. Co.
Baltimore	James A. Gary	Gary Mfg. Co.
Baltimore	Arthur N. Hersom	Mt. Vernon Mills.
Baltimore	Wm. E. Hooper	Woodberry Division of Mt. Vernon Woodberry Co.
Baltimore	Harry W. Kimball	Mt. Vernon Mills.
Baltimore	Charles K. Oliver	U. S. Duck Corporation.
Baltimore	E. W. Thomas	Consolidated Cotton Duck Co.
Baltimore	Charles W. Wood	Continental Cotton Duck Co.
Ilchester	Samuel F. Patterson	Thistle Mills Co.

VIRGINIA.

Danville	George W. Robertson	Dan River Cotton Mills.
Emporia	W. T. Tillar	The Ashby Cotton Mill Co., Inc.

NORTH CAROLINA.

Asheville	Henry Rowe	Elk Mountain Bleachery.
Charlotte	E. N. Clemence	
Charlotte	Stuart W. Cramer	The Whitin Machine Works and Woonsocket Machine & Press Co.
Charlotte	Arthur J. Draper	Hoskins, Louise, Calvine and Dover Yarn Mills.
Charlotte	Edward T. Garsed	
Charlotte	R. M. Miller, Jr.	Elizabeth Mills.
Charlotte	Daniel A. Tompkins	D. A. Tompkins Co.
Charlotte	Frank S. Tucker	Westinghouse Elec. and Mfg. Co.
Cooleeme	Henry J. Forsyth	Cooleeme Cotton Mill.
Duke	James R. Pearce	Erwin Cotton Mills.
Fayetteville	Frank H. Cotton	
Fayetteville	Walter L. Holt	Holt-Morgan Mills.
Greensboro	Caesar Cone	Proximity Mfg. Co.
Greensboro	Farquharson J. Muir	Cone Export & Commission Co.
Lincolnton	R. S. Reinhardt	Elm Grove Cotton Mills.
Lincolnton	James W. Taylor	Wampum Mills.
Spray	Aaron C. Phelps	German-American Co.
Winston-Salem	John W. Fries	F. & H. Fries. & Arista Mills Co.

SOUTH CAROLINA.

Clemson College	Charles S. Doggett	Clemson College.
Columbia	Wallace L. Ball	Columbia Mills Co.

Digitized by Google

Columbia	Louis I. Guion	Columbia Mills Co.
Columbia	W. H. Rose	Richland, Granby & Olympia Cotton Mills.
Graniteville	T. H. Rennie	Graniteville Mfg. Co.
Lancaster	Leroy Springs	Lancaster Cotton Mills.
Langley	Arthur T. Smith	Langley Manufg. Co. and Aiken Manufg. Co.
Newberry	Edward B. Wilbur	Mollohon Mfg. Co.
Ware Shoals	W. C. Cobb	Ware Shoals Mfg. Co.
Union	William P. Heineken	Union Mfg. and Power Co.
Union	Hartley L. Lord	Union-Buffalo Mills Co.

GEORGIA.

Atlanta	Harry K. Drew	Fulton Bag and Cotton Mills.
Atlanta	Oscar Elsas	Fulton Bag and Cotton Mills.
Atlanta	Henry E. Fisher	Atlanta Cotton Mills.
Atlanta	W. T. Jordan	
Augusta	Thomas Barrett, Jr.	Langley & Aiken Mills.
Augusta	T. I. Hickman	Graniteville Mfg. Co.
Augusta	Joel Smith	1311 Woodlawn Ave.
Augusta	George R. Stearns	Riverside Mills.
Chattahoochee	W. R. B. Whittier	Whittier Mills.
Columbus	Frederick B. Gordon	Columbus Mfg. Co.
Columbus	Charles H. Gorton	Columbus Mfg. Co.
Columbus	Walter Rigby	Bibb Mfg. Co.
Columbus	George W. Towne	Bibb Mfg. Co.
East Point	Edward C. Beach	Gate City Cotton Mills.
Lawrenceville	C. Enos Bean	Lawrenceville Mfg. Co.
Lindale	Henry P. Meikleham	Mass. Mills in Georgia.
Macon	H. B. Hopson	Bibb Mfg. Co.
Macon	Logan Owen	Bibb Mfg. Co. Mill No. 1.
Macon	Broadus E. Willingham	Willingham Cotton Mills.
Monroe	Charles M. Sears	Monroe Cotton Mills.
Rome	R. L. Wilson	Floyd Mills.

TENNESSEE.

Knoxville	William T. Lang	Brookside Mills.
Memphis	William Dresser Edwards	Randolph Bldg.

ILLINOIS.

Rockford	Howard D. Colman	Barber-Colman Co.

Digitized by Google

MICHIGAN.

Detroit	Hamilton Carhartt	Hamilton Carhartt Mfg. Co.

MISSISSIPPI.

Agricultural College,	William E. Winchester	Mississippi Textile School.
Starkville	J. D. Mallory	John M. Stone Cotton Mill.
Stonewall	Henry C. Dresser	Stonewall Cotton Mills.

LOUISIANA.

New Orleans	S. Odenheimer	Textile Mills Corp.

KENTUCKY.

Henderson	Paul J. Marrs	Henderson Cotton Mills.
Louisville	O. W. Stites	Louisville Cotton Mills Co.
Louisville	Philip S. Tuley	Louisville Cotton Mills Co.

ALABAMA.

Cordova	Scott Maxwell	Indian Head Mills of Ala.
Tallassee	Byron F. Card	
Tallassee	William E. Elsberry	Tallassee Falls Mfg. Co.

DISTRICT OF COLUMBIA.

Washington	Berton A. Thissell	314 Ninth St., N. W.

WISCONSIN.

St. Croix Falls	Arthur W. Hunking	Stone & Webster.

CALIFORNIA.

Los Angeles	William Warr	Pacific Electrical Bldg.

Digitized by Google

CANADA.

Province of Ontario.

Cornwall	William V. Boyd	Canadian Col'd Cotton Mills Co. Ltd.
Cornwall	S. Greenwood	Canadian Colored Cotton Mills Co., Ltd.
Hamilton	George O. Dexter	Canadian Colored Cotton Mills Co. Ltd.
Hamilton	James M. Young	Hamilton Cotton Co.
Toronto	James P. Murray	Toronto Carpet Mfg. Co.

Province of Quebec.

Montreal	James H. Brand, Jr.	201 Board of Trade Building.
Montreal	C. B. Gordon	Dominion Textile Co., Ltd.
Montreal	Alfred Hawkesworth	Alfred Hawkesworth & Sons, Ltd.
Montreal	Fred Hawkesworth	Alfred Hawkesworth & Sons, Ltd.
Montreal	D. K. McLaren	751 Craig St.
Montreal	A. B. Mole	Dominion Textile Co., Ltd.
Montreal	W. T. Whitehead	Dominion Textile Co.
Valleyfield	Charles H. Potter	Montreal Cotton Co.
Valleyfield	Louis Simpson	Montreal Cotton Co.
Valleyfield	Lewis J. Young	Montreal Cotton Co.

NEW BRUNSWICK.

St. John	John B. Cudlip	Cornwall and York Cotton Mills Co.
St. John	S. P. Gerow	The Cornwall & York Cotton Mills.
Milltown	J. Whidden Graham	Canadian Col'd Cotton Mill Co., Ltd.
Milltown	W. H. Macdonald	Canadian Col'd Cotton Mill Co. Ltd.

ENGLAND.

Cheshire	William Myers	Lecturer in Textiles.
Huddersfield	John Sykes	English Card Clothing Co.
Manchester	C. W. Macara	Harry Bannerman & Sons.
Manchester	John Lincoln Tattersall	Robert Hyde Buckley & Sons, Ltd.
Matlock, Derbyshire,	John Edward Lawton	American Thread Co.
Oldham	Robert Taylor, Jr.	Soho Iron Works.

GERMANY.

Berlin	William F. Parish, Jr.	Vacuum Oil Co.

Digitized by Google

RUSSIA.

Moscow	Vladimir F. Gnesin . . .	The Great Yaroslavl Mfg. Co.
Moscow	Vladimir Malinin	Prochoroff Three Hill Mfg. Co.

JAPAN.

Hiogo	Hachiro Henry Fukuhara .	Sumoto Mill, Kanegafuchi Spinning Co.

Digitized by Google

RECAPITULATION.

LOCATION OF MEMBERSHIP.

Maine	20
New Hampshire	28
Vermont	3
Massachusetts	454
Rhode Island	165
Connecticut	48
New York	64
New Jersey	18
Pennsylvania	53
Delaware	2
District of Columbia	1
Maryland	9
Virginia	2
North Carolina	18
South Carolina	11
Georgia	21
Tennessee	2
Wisconsin	1
Illinois	1
Michigan	1
Mississippi	3
Louisiana	1
Kentucky	3
Alabama	3
California	1
Province of Ontario	5
Province of Quebec	10
New Brunswick	4
England	6
Germany	1
Russia	2
Japan	1
	961

Digitized by Google

Digitized by Google

IN MEMORIAM.

JOHN W. CHAFEE.

JOHN W. CHAFEE, president and treasurer of the Sibley Manufacturing Company of Augusta, Ga., died very suddenly from paralysis while on a trip to New York, March 26, 1907.

Mr. CHAFEE was born in Charleston, S. C., May 1, 1848. His father, OTIS J. CHAFEE, was born in Newport, R. I., whence he removed to Charleston, S. C., where he met and married Miss MARY A. KINLOCK, who was born and reared in that city. The father became a successful wholesale merchant and after the close of the Civil War he located in Aiken, S. C., where both he and his wife passed the remainder of their lives. He was one of fifteen children, and his wife was a member of a family of thirteen children, while to their marriage were born fourteen children. The mother of OTIS J. CHAFEE was a MONROE, being a relative of President MONROE.

JOHN W. CHAFEE secured his earlier training under the direction of private tutors, and then entered the South Carolina Military Academy, known locally as the Citadel, in Charleston, where he effectually rounded out his education.

He initiated his business career as a clerk and was employed in this capacity in Charleston, St. Louis, Mo., and Augusta. In 1870 he become accountant for the firm of Dunbar and Sibley, here, retaining this position for three years, after which he was engaged in a similar capacity with the general firm of J. O. Matthewson & Company until 1881.

Digitized by Google

In 1880 the Sibley Mill was built, and in 1881 Mr. CHAFEE became accountant for the company. Subsequently he became secretary of the institution, as well as of the Langley Manufacturing Company of Langley, Aiken County, S. C. He finally severed his connection with the Langley Company and became treasurer of the Sibley Manufacturing Company an office which he has since retained, and on April 29, 1896, he succeeded WILLIAM C. SIBLEY as president of the company.

Mr. CHAFEE was a member of the Augusta Cotton Exchange and Board of Trade, the Commercial and Country Clubs, the Augusta Game Preserve, and the Benevolent Protective Order of Elks.

On April 26, 1871, Mr. CHAFEE was united in marriage to Miss CAROLINA ARMINDA LATHAM, of Aiken, S. C., but a native of the state of Rhode Island. They had five children.

Mr. CHAFEE, during his entire life commanded the high esteem of all who knew him.

He became a member of this Association October 18, 1900.

ALPHONSE S. COVEL.

ALPHONSE SMITH COVEL, treasurer of the Tremont and Suffolk Mills, Lowell, Mass., died at his home in Boston on Saturday evening, April 13. Mr. COVEL had been in poor health for three months, but his illness did not take a serious turn until the occurrence of a cerebral hemorrhage a week before he died.

Mr. COVEL was born in Fall River, Mass., in 1844, and spent many years of his life in that city. He was treasurer of the Merchants' Manufacturing Company of that city before he was elected treasurer of the Tremont and Suffolk Mills of Lowell in March, 1877. During his connection with this company he became treasurer of the American Printing Company of Fall

Digitized by Google

River, but when the offices of this corporation were removed to New York, about twelve years ago, Mr. COVEL resigned that position. At various times he was connected with many other Fall River enterprises.

During his residence in Boston, Mr. COVEL'S social interests were wide. At the time of his death he was vice-president of the Home Market Club, he was also vice-president of the Lowell Textile School, he had been an active member of the New Old South Church, and for two years was president of the Boston Y. M. C. A., and he was a director of the society when he died. Among other organizations to which he had belonged were the Exchange Club and the Boston Art Club.

His widow is a sister of M. C. D. BORDEN of New York.

He became a member of this Association, October 31, 1877.

MICHAEL W. QUINN.

MICHAEL W. QUINN died in London, England, September 3, 1906. He was born in the north of Ireland February 14, 1845, and at the age of seven months was brought to this country by his parents who settled at Victory Mills, New York.

Here he passed his boyhood days, and upon becoming of sufficient age to engage in labor entered the mills of that place, learning the trade of a mule-spinner.

By diligence and close application to work more advantageous positions were successfully filled at Sag Harbor, Long Island, Indian Orchard, Mass., Taunton, Mass., and Grosvenordale, Conn.

He received the appointment as superintendent of the Eliot Manufacturing Company at East Killingly, Conn., leaving there after a few years to take the management of the Manchaug Mills, Manchaug, Mass., and after about four years resigned to accept

Digitized by Google

the agency of the Fiskdale Mills, Fiskdale, Mass., resigning there in 1887 he accepted the position as agent of the Hamilton Woolen Mills, Amesbury, Mass., which position he filled at the time of his death.

He became a member of this Association October 27, 1886.

WILLIAM HENRY RENNIE.

WILLIAM HENRY RENNIE was born in Lewiston, Me., March 7, 1881, and died at Warrenville, S. C., September 23, 1906.

He removed from Lewiston, Me., September, 1882, to Graniteville, S. C. Here he attended the public schools from which he entered the South Carolina Military Academy and later the Stevens Institute of Technology at Hoboken, N. J.

He was for five years in the service of the Graniteville Manufacturing Company, where he studied manufacturing.

March 1, 1906, he was appointed superintendent of the Warren Manufacturing Company, Warrenville, S. C., which position he was filling most acceptably at the time of his demise.

He became a member of this Association April 26, 1906.

HENRY A. TILLINGHAST.

HENRY A. TILLINGHAST was born in Providence, R. I., September 15, 1859, and died in the same city March 18, 1907. He made Providence his home during his entire life, graduating from the Mowry and Goff School, and afterwards, in 1882, from Brown University. Upon completing his studies he immedi-

Digitized by Google

ately started in business with the Granger Foundry and Machine Company, and was actively connected with that company until it was merged in 1902 with other companies to form the Textile Finishing Machinery Company.

He was for a number of years secretary treasurer of the Granger Foundry and Machine Company, and when the Textile Finishing Machinery Company was organized became secretary and treasurer of that company and held those offices at the time of his death.

From the time of his graduation from college until his death he was very actively engaged in business, being a director in several companies besides those referred to above.

He became a member of this Association August 25, 1901.

Digitized by Google

Digitized by Google

TRANSACTIONS.

In accordance with legal notice, the stated annual meeting of the Association, being the eighty-second meeting, was held at Huntington Hall, Massachusetts Institute of Technology, Boston, Mass., on Wednesday and Thursday, April 24 and 25, 1907.

The following 305 members and 130 guests were present:

MEMBERS.

ALFRED E. ADAMS, Whitinsville, Mass.
JOSEPH D. AIKEN, Taftville, Conn.
CHARLES B. AMORY, Boston, Mass.
EUGENE C. ANDRES, Boston, Mass.
HENRY B. ASHTON, Brookline, Mass.
HENRY ASHWORTH, Fall River, Mass.
H. C. ATWOOD, Killingly, Conn.
LOUIS A. AUMANN, Chicopee, Mass.
GEORGE A. AYER, Easthampton, Mass.
NATHANIEL F. AYER, Boston, Mass.
J. W. BAILEY, Fall River, Mass.
JOSEPH W. BALLARD, Griswoldville, Mass.
EDWARD R. BALLOU, Providence, R. I.
FREDERICK D. BALLOU, Jewett City, Conn.
EDWARD E. BARTLETT, Warren, R. I.
EDWIN N. BARTLETT, North Oxford, Mass.
JOSEPH P. BATTLES, Lawrence, Mass.
GEORGE W. BEAN, Lewiston, Me.
ROBERT BEATTY, Philadelphia, Pa.
ALBERT FARWELL, Bemis, Boston, Mass.

Digitized by Google

ALBERT BIRCH, Somerville, Mass.
F. H. BISHOP, Boston, Mass.
WILLIAM WASHINGTON BLADES, Pawtucket, R. I.
CHARLES RAY BLAKE, Lowell, Mass.
EDWIN E. BLAKE, Biddeford, Me,
T. ASHBY BLYTHE, Philadelphia, Pa,
JOSEPH W. BOOTH, Providence, R. I.
HENRY DEAN BOURNE, Manchester, N. H.
STEPHEN N. BOURNE, Manchester, N. H.
CHARLES A. BOWEN, New Bedford, Mass.
ARTHUR F. BRACKETT, Riverpoint, R. I.
ARTHUR T. BRADLEE, Boston, Mass.
J. FRANK BRAIDS, Providence, R. I.
ALBERT W. BRAINERD, Lawrence, Mass.
JAMES H. BRAND, Jr., Montreal, P. Q.
HENRY GORDON BRINCKERHOFF, Boston, Mass.
JAMES T. BROADBENT, Fall River, Mass.
CHRISTOPHER P. BROOKS, New Bedford, Mass.
H. MARTIN BROWN, Providence, R. I.
HENRY R. BROWN, Phenix, R. I.
W. IRVING BULLARD, Danielson, Conn.
E. R. BULLOCK, Pawtucket, R. I.
ROBERT BURGESS, Pawtucket, R. I.
JOHN H. BURGHARDT, Boston, Mass.
EDWARD N. BURKE, Lowell, Mass.
CHARLES B. BURLEIGH, Boston, Mass.
EUGENE E. BURNHAM, Lawrence, Mass.
HERMON N. BURPEE, Boston, Mass.
JOHN L. BURTON, New Bedford, Mass.
HARRY W. BUTTERWORTH, Phiadelphia, Pa.
SAMUEL T. BUTTERWORTH, Baltic, Conn.
WILLIAM H. CADWELL, Nashua, N. H.
L. W. CAMPBELL, Woonsocket, R. I.
MALCOLM CAMPBELL, Woonsocket, R. I.
W. W. CAREY, Lowell, Mass.
STEWART F. CARTER, Suffern, N. Y.
BENJAMIN C. CHACE, Jr., Pawtucket, R. I.
ALFRED M. CHADWICK, Lowell, Mass.
CHARLES H. CHILD, Providence, R. I.
ERNEST E. CLARK, Killingly, Conn.
MELVIN H. COFFIN, Whitinsville, Mass.
CHARLES H. COLLINS, Ashton, R. I.
JOHN A. COLLINS, Fall River, Mass.
FRANK B. COMINS, Boston, Mass.

Digitized by Google

James A. Cooper, Whitinsville, Mass.
Thomas G. Cox, Taunton, Mass.
Amos Crankshaw, Pawtucket, R. I.
George Crompton, Worcester, Mass.
William W. Crosby, Woburn, Mass.
John B. Cudlip, St. John, N. B.
H. H. Culver, Taunton, Mass.
Joseph L. Cushing, Lowell, Mass.
Philip Dana, Westbrook, Me.
Daniel J. Danker, Boston, Mass.
John O. DeWolfe, Boston, Mass.
Henry C. Dexter, Pawtucket, R. I.
Frederick N. Dillon, Fitchburg, Mass.
Albert W. Dimick, Fisherville, Mass.
Ezra Dixon, Bristol, R. I.
C. E. W. Dow, Boston, Mass.
George Otis Draper, Hopedale, Mass.
John H. Dunn, Lowell, Mass.
Frank J. Dutcher, Hopedale, Mass.
Charles H. Eames, Lowell, Mass.
Fred W. Easton, Pawtucket, R. I.
Russell W. Eaton, Brunswick, Me.
John Eccles, Taftville, Conn.
Frederick W. Ely, Greenville, N. H.
G. B. Emmons, Lawrence, Mass.
John H. Estes, Fall River, Mass.
John A. Fernley, New Bedford, Mass.
Frank S. Field, Shattuckville, Mass.
Eugene Finocchiaro, Chelsea, Mass.
Charles H. Fish, Dover, N. H.
George Fish, Lowell, Mass.
Frederick A. Flather. Boston, Mass.
M. F. Foster, Milford, N. H.
E. T. Fowler, Westfield, Mass.
Edward W. France, Philadelphia, Pa.
John W. France, Chester, Pa.
Arthur C. Freeman, Providence, R. I.
Arnold C. Gardner, New Bedford, Mass.
Roland Gerry, Pittsburg, Penn.
Charles E. Getchell, Waltham, Mass.
Vladimir F. Gnesin, Moscow, Russia.
Albert H. Goff, Pawtucket, R. I.
Rufus B. Goff, Providence, R. I.
Alfred M. Goodale, Boston, Mass.

Digitized by Google

J. WHIDDEN GRAHAM, Milltown, New Brunswick.
D. W. GRAY, Utica, N. Y.
R. A. GRAY, Allenton, R. I.
EDWIN FARNHAM GREENE, Boston, Mass.
S. HAROLD GREENE, Boston, Mass.
JOHN GREGSON, Fiskdale, Mass.
DAVID GROVE, Central Falls, R. I.
EDMOND H. GUERIN, Woonsocket, R. I.
ARTHUR H. GULLIVER, Norwich Town, Conn.
FRANK J. HALE, Newton Upper Falls, Mass.
WALTER B. HALL, Lowell, Mass.
WILLIAM E. HALL, Lowell, Mass.
Z. D. HALL, Adams, Mass.
GEORGE B. HAMBLIN, Whitinsville, Mass.
JOHN F. HAMLET, Fall River, Mass.
HENRY F. HARRIS, Worcester, Mass.
ALFRED H. HARTLEY, Fall River, Mass.
FRANK HARTLEY, Webster, Mass.
WILLIAM D. HARTSHORNE, Lawrence, Mass.
CHESTER D. HATCH, Exeter, N. H.
WILLIAM B. HAWES, Fall River, Mass.
CHARLES HAYES, Jr., Utica, N. Y.
ERNEST L. HERSOM, Fitchburg, Mass.
FRANKLIN W. HOBBS, Boston, Mass.
CLARK W. HOLCOMB, New Bedford, Mass.
CHARLES M. HOLMES, New Bedford, Mass.
GEORGE W. HOLT, Putman, Conn.
JOHN H. HOLT, Fall River, Mass.
WILLIAM P. HOLT, Fall River, Mass.
EDWARD W. HOUGHTON, Woonsocket, R. I.
HENRY S. HOUGHTON, Jr., Worcester, Mass.
HENRY S. HOUGHTON, Sr., Woonsocket, R. I.
A. H. HOWARD, Worcester, Mass.
FREDERIC W. HOWE, Providence, R. I.
SAMUEL T. HUBBARD, New York City.
OTIS L. HUMPHREY, Boston, Mass.
JOSEPH R. JAMIESON, Boston, Mass.
EARL S. JENCKES, Northbridge, Mass.
W. H. JILLSON, Westfield, Mass.
LEONARD S. JOHNSTON, Cohoes, N. Y.
NELSON D. KEABLES, Lowell, Mass.
LAWRENCE M. KEELER, Whitinsville, Mass.
ROLAND M. KELLY, Williamstown Station, Mass.
JOHN E. KENDRICK, Providence, R. I.

Digitized by Google

FRANK B. KENNEY, Lowell, Mass.
NATHANIEL KINSMAN, Jr., Boston, Mass.
JESSE A. KNIGHT, Gloucester City, N. J.
STEPHEN A. KNIGHT, Providence, R. I.
WALTER B. KNIGHT, Willimantic, Conn.
FRED LACEY, Lowell, Mass.
W. C. LANGFORD, Providence, R. I.
BERRY LAYCOCK, Unionville, Mass.
EVAN ARTHUR LEIGH, Boston, Mass.
J. COLBY LEWIS, Salmon Falls, N. H.
CHARLES F. LIBBY, Lowell, Mass.
WILLIAM H. LOFTUS, Newark, N. J.
HARRY D. LORD, Biddeford, Me.
WILLIAM C. LOVERING, Boston, Mass.
ARTHUR H. LOWE, Fitchburg, Mass.
STEPHEN C. LOWE, Boston, Mass.
WILLIAM H. LYALL, Passaic, N. J.
HERBERT LYMAN, Boston, Mass.
JAMES R. MACCOLL, Pawtucket, R. I.
ALEXANDER MAKEPEACE, Providence, R. I.
CHARLES H. MANNING, Manchester, N. H.
HENRY F. MANSFIELD, Utica, N. Y.
AUGUSTUS B. MARBLE, Boston, Mass.
EDWIN H. MARBLE, Worcester, Mass.
JOHN P. MARSTON, Boston, Mass.
FAY H. MARTIN, Boston, Mass.
HENRY D. MARTIN, Lancaster, Mass.
ROBERT MCARTHUR, Biddeford, Me.
JOHN E. MCLAUGHLIN, Utica, N. Y.
WILLIAM G. MCLOON, Clinton, Mass.
ROBERT G. MCMEEHAN, Uncasville, Conn.
WILLIAM P. MCMULLAN, Salem, Mass.
ROBERT B. MEIKLE, Westerly, R. I.
JOSEPH MERCER, Williamantic, Conn.
BERNARD MERRIAM, South Framingham, Mass.
JOSEPH MERRIAM, Middletown, Conn.
MELDON H. MERRILL, Boston, Mass.
WALTER C. METCALF, Westboro, Mass.
ALBERT D. MILLIKEN, New Bedford, Mass.
ROSCOE S. MILLIKEN, Nashua, N. H.
JOHN R. MITCHELL, New York City.
A. B. MOLE, Montreal, P. Q.
EDWARD A. MONGEON, Lonsdale, R. I.
J. R. MONTGOMERY, Windsor Lockes, Conn.

Digitized by Google

FRED W. MOORE, Millbury, Mass.
WILLIAM F. MORGAN, Fitchburg, Mass.
GEORGE B. MORISON, Boston, Mass.
ALBERT H. MORTON, Lowell, Mass.
W. C. MURPHY, Providence, R. I.
ROBERT W. NEFF, Boston, Mass.
JOHN NEILD, New Bedford, Mass.
HUGH NELSON, New York City.
JOHN H. NELSON, Lynn, Mass.
WILL NELSON, Lowell, Mass.
H. W. NICHOLS, New Bedford, Mass.
WILLIAM G. NICHOLS, Suncook, N. H.
ALBERT W. NOONE, Peterboro, N. H.
WILLIAM R. NOONE, Boston, Mass.
THOMAS J. O'KEEFE, Boston, Mass.
LOUIS ATWELL OLNEY, Lowell, Mass.
WILLIAM B. ORR, Forestdale, R. I.
OSCAR L. OWEN, Whitinsville, Mass.
SIDNEY B. PAINE, Boston, Mass.
O. B. PARKER, Quidnick, R. I.
WALTER E. PARKER, Lawrence, Mass.
ARTHUR PARKINSON, New York City.
ARTHUR H. PAUL, Waltham, Mass.
H. M. PIERCE, East Greenwich, R. I.
WILLIAM C. PIERCE, Providence, R. I.
HAVEN C. PERHAM, Lowell, Mass.
THOMAS PERKINS, Lowell, Mass.
CHARLES M. PERRY, Saylesville, R. I.
VICTOR E. PIHL, Lowell, Mass.
CHARLES T. PLUNKETT, Adams, Mass.
WILLIAM C. PLUNKETT, Adams, Mass.
CHARLES H. POTTER, Valleyfield, P. Q.
GEORGE E. PREST, Melrose, Mass.
JOHN E. PREST, Melrose, Mass.
JOHN F. REARDON, Millville, N. J.
H. L. REYNOLDS, Saundersville, Mass.
FRANCIS H. RICE, Millbury, Mass.
HARRY J. RICKETSON, Fall River, Mass.
BENJAMIN H. ROBERTS, Fall River, Mass.
ELWIN H. ROONEY, Whitinsville, Mass.
ALFRED SAGAR, Methuen, Mass.
W. K. SANBORN, West Kennebunk, Me.
ARNOLD B. SANFORD, Boston, Mass.
J. L. SANFORD, Boston, Mass.

Digitized by Google

PARDON B. SANFORD, Utica, N. Y.
ROBERT SCHOFIELD, New Bedford, Mass.
DWIGHT SEABURY, Pawtucket, R. I.
ALBION K. SEARLES, Utica, N. Y.
WILLIS S. SHEPARD, Boston, Mass.
WILLIAM F. SHERMAN, Boston, Mass.
LEWIS T. SHURTLEFF, New Bedford, Mass.
LOUIS SIMPSON, Valleyfield, P. Q.
JOHN SKINNER, Easthampton, Mass.
H. COWLES SMITH, New York City.
HARRY M. SMITH, Worcester, Mass.
J. C. SMITH, Fall River, Mass.
THOMAS HENRY SMITH, Jamestown, N. Y.
ANTONIO SPENCER, Providence, R. I.
WILTON H. SPENCER, Providence, R. I.
T. B. STEVENSON, Manchaung, Mass.
ROBERT STEWART, Webster, Mass.
WALTER F. STILES, Fitchburg, Mass.
WALLACE I. STIMPSON, Hopedale, Mass.
JAMES STRANG, Indian Orchard, Mass.
JACOB STEPHANS, Pawtucket, R. I.
ADOLPH SUCK, Boston, Mass.
JOHN SULLIVAN, Boston, Mass.
JAMES O. SWEET, Jewett City, Conn.
E. KENT SWIFT, Whitinsville, Mass.
CHARLES A. TABOR, Thorndike, Mass.
JAMES W. TAYLOR, Cohoes, N. Y.
SAMUEL TAYLOR, New Bedford, Mass.
J. LINCOLN TATTERSALL, Manchester, England.
GAY D. THAYER, Worcester, Mass.
EARL A. THISSELL, Lowell, Mass.
CHARLES E. THOMAS, Woonsocket, R. I.
JOSEPH THOMSON, Boston, Mass.
JAMES T. THORNTON, Providence, R. I.
JAMES P. TOLMAN, Boston, Mass.
GEORGE W. TOWNE, Columbus, Ga.
ALLISON W. TRAFFORD, Fall River, Mass.
W. S. TRICKETT, Montville, Conn.
C. H. TRUESDELL, Killingly, Conn.
OSCAR B. TRUESDELL, Newtonville, Mass.
GEORGE W. TURNER, Gloucester City, N. J.
GEORGE A. VAUGHAN, Putnam, Conn.
CLEMENT A. WAKEFIELD, Biddeford, Me.
HERBERT E. WALMSLEY, New Bedford, Mass.

Digitized by Google

JUSTIN A. WARE, Spring Hill, Mass.
LETTICE R. WASHBURN, New Bedford, Mass.
JOSEPH WATTERS, Fall River, Mass.
WALTER WHIPPLE, Claremont, N. H.
ALPHONSO F. WHITE, Forestdale, R. I.
W. T. WHITEHEAD, Montreal, P. Q., Canada.
JOHN K. WHITTIER, Lowell, Mass.
JOHN B. WILD, Utica, N. Y.
FRED A. WILDE, Readville, Mass.
EBEN C. WILLEY, Fall River, Mass.
EUGENE F. WILLEY, Fall River, Mass.
FRANKLIN D. WILLIAMS, Boston, Mass.
HENRY WILLIAMS, Taunton, Mass.
ELIAS S. WILLIS, Taunton, Mass.
NEWTON WILSON, Shirley, Mass.
SAMUEL F. WINSPER, New Bedford, Mass.
WILLIAM P. WOOD, Pawtucket, R. I.
C. J. H. WOODBURY, Lynn, Mass.
MARCUS J. WOODROW, Woonsocket, R. I.
ADELBERT R. YOUNG, Jewett City, Conn.
GEORGE E. ZELLERS, Lancaster, Penn.

GUESTS.

J. S. ADAMS, Adams, Mass.
H. L. ALBRACHT, Lynn, Mass.
WM. G. ANTHONY, Providence, R. I.
R. C. ASHWORTH, Fall River, Mass.
A. A. ASPINWALL, Pawtucket, R. I.
C. W. ATWOOD, Killingly, Ky.
FREDERIC L. BABCOCK, Boston, Mass.
A. A. BALLART, Providence, R. I.
H. J. BALLOU, Boston, Mass.
E. J. BARRY, New Bedford, Mass.
S. Q. BASS, Lawrence, Mass.
G. C. BENNETT, Niagara Falls, New York.
GEORGE H. BLAKE, Boston, Mass.
T. B. BOLAN, Philadelphia, Pa.
H. C. BRADFIELD, Boston, Mass.
Hon. J. G. BRADY, Brookline, Mass.
CLEMENTS A. BROWN, Providence, R. I.
F. L. BROWN, Boston, Mass.
H. V. BROWN, Worcester, Mass.
J. A. BRYANT, Boston, Mass.

Digitized by Google

E. W. BURDETT, Boston, Mass.
F. H. BURT, Boston, Mass.
ALFRED E. BURTON, Boston, Mass.
A. C. BUZZELL, Woonsocket, R. I.
GEORGE O. CAPRON, Pawtucket, R. I.
CHARLES F. CHASE, New York City.
F. L. CHASE, Providence, R. I.
HARVEY STUART CHASE, Boston, Mass.
C. H. CLARK, New York City.
FRED J. COOKE, Boston, Mass.
E. L. COOLEY, Boston, Mass.
COURTENAY CROCKER, Boston, Mass.
JAMES W. CUMNOCK, Boston, Mass.
SAMUEL L. DALE, Boston, Mass.
H. N. DAWES, Boston, Mass.
W. C. DODGE, Providence, R. I.
B. W. DOW, Dorchester, Mass.
T. OLIVER DOWD, Boston, Mass.
EDWARD F. DRAPER, Boston, Mass.
GEORGE H. EDDY, Boston, Mass.
W. M. FISKE, Providence, R. I.
MARTIN FITCH, Lynn, Mass.
Hon. JOHN F. FITZGERALD, Boston, Mass.
JOHN FOORD, New York City.
JOHN FRANCE, Lawrence, Mass.
A. M. FRASER, Fall River, Mass.
W. H. GARDINER, New York City.
FRANK GARNISS, Fall River, Mass.
N. L. GIBBON, Biddeford, Me.
M. E. GLEASON, Providence, R. I.
D. L. GOFF, Pawtucket, R. I.
JEREMIAH GOFF, Charlotte, N. C.
L. W. GOODRICH, Boston, Mass.
Col. GEORGE A. GORDON, Savannah, Ga.
A. H. GREEN, Lowell, Mass.
E. HADLEY, Jr., Boston, Mass.
HAROLD C. HANSEN, New York City.
W. H. HARRISS, Atlanta, Ga.
E. A. HARTSHORN, New York City.
JOSEPH C. HARTWELL, Providence, R. I.
ARTHUR I. HARVEY, Providence, R. I.
J. F. HARVEY, Lowell, Mass.
W. L. HASKEL, Boston, Mass.
CHARLES T. HATCH, Baltic, Conn.

Digitized by Google

George B. Haven, Boston, Mass.
William B. Hayes, New York City.
G. A. Haynes, Boston, Mass.
F. D. Heath, Boston, Mass.
Charles A. Hersom, Boston, Mass.
H. G. Hogg, Utica, New York.
W. J. Holland,
Ellsworth Huntington, Milton, Mass.
Edward A. Jamieson, Boston, Mass.
John P. Judge, Baltimore, Md.
Austin D. Keables, Boston, Mass.
A. J. Kelly, Boston, Mass.
Joseph C. King, Somerville, Mass.
S. W. Kirkland, Boston, Mass.
A. W. Kirkpatrick, New York City.
Henry C. Kittredge, Boston, Mass.
H. S. Knowlton, Newton, Mass.
George M. Lane, Penacook, N. H.
J. K. Lanning,
Hon. George P. Lawrence, North Adams, Mass.
Joseph T. Leach, Fall River, Mass.
W. B. MacColl, Providence, R. I.
M. H. McKibbin, Boston, Mass.
John S. Merchant, Providence, R. I.
E. L. Merrow, Providence, R. I.
M. A. Metcalf, Boston, Mass.
Herbert Midgley, Worcester, Mass.
W. C. Moore, Greenville, S. C.
Charles M. Mumford, Boston, Mass.
Charles F. Murphy, Boston, Mass.
L. B. Murray, Boston, Mass.
Frank L. Nagle, Boston, Mass.
A. W. Newell, Providence, R. I.
J. G. Nicholson, New Bedford, Mass.
F. G. Page, Pawtucket, R. I.
Charles W. Peirce, Providence, R. I.
Loren W. Penney, Newton Upper Falls, Mass.
Robert H. Perkins, Boston, Mass.
F. B. Perry, Boston, Mass.
W. L. Puffer, Boston, Mass.
J. G. F. Randolph, Boston, Mass.
A. F. Ray, Boston, Mass.
R. L. Reynolds, Pawtucket, R. I.
Henry K. Rowell, Boston, Mass.

Digitized by Google

W. H. SHERMAN, Providence, R. I.
Gen. THOMAS SHERWIN, Boston, Mass.
D. L. SMITH, Boston, Mass.
F. W. SMITH, Pawtucket, R. I.
W. O. SMITH, East Brimfield, Mass.
A. E. SPROUL, Boston, Mass.
H. E. STAFFORD, Providence, R. I.
G. F. STEELE, Boston, Mass.
J. T. SULLIVAN, Boston, Mass.
Prof. ELIHU THOMSON, Swampscott, Mass.
L. A. TOBIN, Boston, Mass.
Hon. GEORGE H. UTTER, Westerly, R. I.
Hon. WILBUR F. WAKEMAN, New York City.
JOHN A. WALKER, Boston, Mass.
ALBERT WALTON, Boston, Mass.
JAMES WALTON, Taunton, Mass.
PHILIP C. WENTWORTH, Fall River, Mass.
ALEXANDER S. WEST, Providence, R. I.
J. R. WHITWORTH, South Boston, Mass.
G. B. WILSON, Brookline, Mass.
JAMES F. WOOD, Boston, Mass.
R. L. WOODWARD, Boston, Mass.

Digitized by Google

FIRST SESSION.

WEDNESDAY MORNING, APRIL 24, 1907.

The Association met in Huntington Hall, at 11 A. M., the President, Mr. JAMES R. MACCOLL, in the chair.

The PRESIDENT. Gentlemen, if you will please come to order, the Secretary will proceed with the business.

The Secretary read the following call for the meeting:

BOSTON, MASS., April 1, 1907.

To the Members:

Notice is hereby given that the stated Annual Meeting of this Association will be held at Boston, Mass., Wednesday and Thursday, April 24 and 25, 1907.

The sessions will be held in Huntington Hall of the Massachusetts Institute of Technology, 491 Boylston street, Boston. The building can be reached by taking the elevated railway to the Park street station in the Subway, and changing there to any street car going south.

The sessions will be called to order on Wednesday at 11 A. M., and 2 P. M.; on Thursday at 10 A. M.

His Honor, JOHN F. FITZGERALD, Mayor of Boston, will welcome the Association to the City.

Digitized by Google

Wednesday evening will be devoted to a banquet at Hotel Brunswick at 6 o'clock for 6.30 P. M.

Members can obtain tickets for themselves and their guests at four dollars each before 10 o'clock on the day of the dinner by application to the Association, Post Office Box 3672, Boston, Mass.

As the Association does not keep an open account on the matter of the dinner, checks should accompany the orders for seats.

Candidates for membership can obtain tickets the same as members, but tickets for non-members must be obtained on their behalf by those members of whom they are personal guests.

The general arrangements will be in charge of the dinner committee, consisting of Messrs. FRANKLIN D. WILLIAMS, Chairman; ALBERT FARWELL BEMIS, CHARLES H. FISH and GEORGE B. MORISON.

Thursday afternoon will be devoted to an excursion to the River Works of the General Electric Company at Lynn.

Special electric cars will leave Boylston street, in front of the Massachusetts Institute of Technology at 1.30 P. M., by which the Works will be reached in about forty-five minutes.

Transportation from Boston to the River Works will be furnished without charge by the General Electric Company to all who are wearers of the member's pin badge, which will include candidates for membership, as well as those who are already members.

Any deviations from the above conditions must be made by the General Electric Company, and not by the Association, who are merely guests in the matter.

Guides will escort the party around these Works where they will be shown the manufacture of steam turbines, electric motors, generators and other apparatus.

On the return special electric cars will leave the River Works at 5.00 P. M., arriving at the North Union station in Boston at 5.50 P. M., or at the South Terminal station at 6.00 P. M., and arriving at the point of departure, Massachusetts Institute of Technology, 6.10 P. M.

These cars will not stop on the trip from Boston to Lynn, but on the return will stop at any point to leave passengers.

Parties may leave the River Works at the same time and connect with Lynn cars, reaching Lynn station of the Boston & Maine Railroad, at 5.30 P. M.

In addition to papers by members, addresses will be given by EVERETT

Digitized by Google

W. BURDETT, Esq., of Boston, HARVEY S. CHASE, Esq., Boston, Mass., JOHN FOORD, Esq., Secretary American Asiatic Association, New York City, and Col. G. A. GORDON, Esq., Savannah, Ga.

The bills for dues for the fiscal year beginning April 1, 1907, are enclosed herewith.

By order of the Board of Government.

Respectfully submitted,

C. J. H. WOODBURY,
Secretary.

The Bureau of Manufactures of the Department of Commerce and Labor, Washington, will exhibit at the meeting a large number of samples of cotton goods and yarns sold in the Chinese markets.

The full programme will not be issued until the meeting, but papers are expected on the following subjects, and advance copies of any papers which are printed in time will be sent to the members on request.

American Cotton Textiles in the Far East.
Corporations and the Public Welfare.
Cost of Maintenance and Depreciation in Cotton Mills.
Hot Water Heating by Forced Circulation.
Proposed System for Cleaning Machinery.
Reinforced Concrete Construction Especially Applied to Mill Use.
Report of Committee on Moisture in Baled Cotton.
Sea Island Cotton.
The Tariff on Cotton Goods.
Taxation and Valuation With Reference to Industrial Plants.
The Whitin High Speed Comber.
The New York Cotton Exchange and Its Contract for Delivery of Cotton.
The Textile School a Necessity to the Future of the Industry.

The Committee on Meeting wearing white rosettes, consists of Messrs. GEORGE OTIS DRAPER, Chairman and NATHANIEL F. AYER, DANIEL J. DANKER, JOHN O. DEWOLF and EDWIN FARNHAM GREENE, who will have general charge of the meeting.

Digitized by Google

Hotel Brunswick opposite the Institute of Technology will serve a special lunch in a dining room reserved from 12.30 until 2.30 for those attending the meetings. Tickets to be obtained at the hotel desk.

The souvenir badges will be given to those members who are in attendance, and the Board of Government has given instructions that duplicates shall not be given until after the adjournment, but other souvenir badges will be given to the guests of members.

A blank proposition for membership is enclosed for convenience in submitting the names of any who would be desirable members. Many persons have not become members because they have not been invited. Candidates for membership will receive the same privileges as the members. Blank propositions are also inside the front cover of the Transactions, or will be sent on application.

Members are especially invited to visit the textile collection of the Boston Museum of Fine Arts, which comprises the best collection in this country. Special facilities for study or copy of specimens will be given to members of the Association on application.

Copies of the Report of the Third International Cotton Congress, held at Bremen, may be obtained at the meeting, or will be sent free on application to this Association, Postoffice Box 3672, Boston, Mass.

Members who have overlooked their postal card receipts for Transactions are requested to give the matter attention, as it is only through this means that the headquarters of the Association are able to know that members receive the volumes and notices to which they are entitled, and to keep an accurate record for sending Transactions and notices to members.

It is important that the Association should be promptly informed of changes of address of any members, in order that they may promptly receive their copies of Transactions.

The SECRETARY. Mr. President, I certify that in accordance with Article 15 of the by-laws, I mailed a copy of this call to each member of the Association ten days at least before this

Digitized by Google

date and that in compliance therewith a quorum is now present and ready to do any business which may legally come before this meeting.

The programme of the meeting was as follows:

PROGRAMME.

First Session, Wednesday, April 24, 1907, at 11 A. M.

Call to Order.

Business.

Reports of Secretary and Treasurer.

Award of Association Medal.
CHARLES T. PLUNKETT, *Chairman*, Adams, Mass.

Welcome to the Institute.
HENRY SMITH PRITCHETT, LL. D., President Massachusetts Institute of Technology, Boston, Mass.

Welcome to the City.
His Honor, JOHN F. FITZGERALD, Mayor of Boston.

President's Address.
JAMES R. MACCOLL, Providence, R. I.

Corporations and the Public Welfare.
EVERETT W. BURDETT, Esq., Boston, Mass.

The Cost of Maintenance and Depreciation in Cotton Mills.
HARVEY STUART CHASE, Esq., Boston, Mass.

Taxation and Valuation with Reference to Industrial Plants.
HENRY K. ROWELL, Esq., Boston, Mass.

Propositions for membership should be in the hands of the Secretary on Wednesday.

Digitized by Google

Hotel Brunswick opposite the Institute of Technology will serve a special lunch in a dining room reserved from 12.30 until 2.30 for those attending the meetings. Tickets to be obtained at the hotel desk.

Second Session, Wednesday, April 24, 1907, at 2 P. M.

Business.

The New York Cotton Exchange and its Contract for Delivery of Cotton.
SAMUEL T. HUBBARD, 66 Beaver St., New York City.

The Tariff on Cotton Goods.
EDWIN A. HARTSHORN, 52 Leonard St., New York City.

American Cotton Textiles in the Far East.
JOHN FOORD, Secretary American Asiatic Association, New York City.

Sea Island Cotton.
GEORGE A. GORDON, Savannah, Georgia.

Report of Committee on Moisture in Baled Cotton.
WM. D. HARTSHORNE, *Chairman*, C. P. BROOKS and LOUIS A. OLNEY.

THE ASSOCIATION DINNER.

Wednesday evening will be devoted to a banquet at Hotel Brunswick at 6 o'clock for 6.30 P. M.

The general arrangements will be in charge of the dinner committee, consisting of Messrs. FRANKLIN D. WILLIAMS, Chairman; A. F. BEMIS, CHARLES H. FISH and GEORGE B. MORISON.

Members can obtain tickets for themselves and their guests at four dollars each before noon on Wednesday, by application at the office of the Association or of the Dinner Committee at the meeting.

Candidates for membership can obtain tickets the same as members, but tickets for non-members must be obtained on their behalf by those members of whom they are personal guests.

Digitized by Google

Third Session, Thursday, April 25, 1907, at 10 A. M.

Election of Members.

The Textile School a Necessity to the Future of the Industry.
EDWARD W. FRANCE, Director Philadelphia Textile School, Philadelphia, Penn.

The Whitin High Speed Comber.
ELWIN H. ROONEY, Whitinsville, Mass.

Election of Officers.

Proposed System for Cleaning Machinery.
ROBERT SCHAELLIBAUM, Providence, R. I.

Hot Water Heating by Forced Circulation.
J. A. ALMIRALL, 281 Water St., New York City.

Reinforced Concrete Construction Especially Applied to Mill Use.
ADOLPH SUCK, M. E., Boston, Mass.

The Committee on Meeting wearing white rosettes, consists of Messrs. GEORGE OTIS DRAPER, Chairman; NATHANIEL F. AYER, DANIEL J. DANKER, JOHN O. DEWOLF and EDWIN FARNHAM GREENE, who will have general charge of the session.

Fourth Session, Thursday, April 25, 1907, at 1.30 P. M.

Thursday afternoon will be devoted to an excursion to the River Works of the General Electric Company at Lynn.

Special electric cars will leave Dartmouth street, opposite the Public Library, at 1.30 P. M., by which the Works will be reached in about an hour.

Transportation from Boston to the River Works and return to Boston will be furnished without charge by the General Electric Company to all who are wearers of the member's pin badge, which will include candidates for membership, as well as those who are already members.

Any deviations from the above conditions must be made by the General Electric Company, and not by the Association, who are merely guests in the matter.

Digitized by Google

A light lunch will be served at the River Works during the afternoon.

On the return special electric cars will leave the River Works at 5.00 P. M., arriving at the North Union station in Boston at 5.50 P. M., or at the South Terminal station at 6.00 P. M., and arriving at the point of departure, Massachusetts Institute of Technology, 6.10 P. M.

These cars will not stop on the trip from Boston to Lynn, but on the return will stop at any point to leave passengers.

Parties may leave the River Works at the same time and connect with Lynn cars, reaching Lynn station of the Boston & Maine Railroad, at 5.30 P. M.

The River Works were established in 1892 and employ 6,000 operatives, while an equal number are at the West Lynn Works, which are devoted to the manufacture of meters, instruments, arc lamps, small motors, and supplies, and at the third Lynn factory, in the manufacture of incandescent lamps. The limited time at the disposal of the party will confine the visit to the River Works. At this branch of the establishment are iron and steel foundries, with additional factories aggregating over a mile in length, for the manufacture of transformers, generators, stationary and railway, gears, pinions, etc. One of the larger buildings is devoted to the manufacture of the Curtis turbine, in sizes from 20 to 2,000 K. W. A heavy three-story steel-concrete building, intended exclusively for the manufacture of stationary motors, is nearing completion and awaiting equipment.

Electric power transmission is used throughout the entire plant and all machine tools installed during recent years are provided with individual electric drive.

The range and variety of work performed at this plant will afford opportunities to inspect many interesting mechanical tools and modern methods.

Complimentary Telephone Service will be furnished to the members of The National Association of Cotton Manufacturers by the courtesy of the New England Telephone and Telegraph Company and of the American Telephone and Telegraph Company.

Two telephone booths will be placed in the vestibule to Huntington Hall on the second story at the left of the top of the stairs.

This free service is available for local use throughout the Metropolitan district during the day and for toll or long distance lines before 10 A. M. and after 4 P. M. and until 6 P. M. to members as identified by their badges.

Digitized by Google

Non-members can obtain telephone service at these booths on payment of the regular tariff rates.

The souvenir badges will be given to those members who are in attendance and the Board of Government has given instructions that duplicates shall not be given until after the adjournment, but other souvenir badges will be given to the guests of members.

A limited number of tickets, each admitting the bearer with friends, including ladies, to the exhibition of paintings at the Boston Art Club, corner of Dartmouth and Newbury streets, open from 9 A. M. to 10 P. M., may be obtained of the Secretary.

The Boston Museum of Fine Arts invites the members to examine their collection of Textiles at any time between 9 A. M. and 1 P. M., or between 2 P. M. and 5 P. M., on either day of the meeting. In addition to the tapestries, rugs, velvets and silks exhibited in the Textile Gallery on the second floor, a large collection of rare textiles may be seen in room 14 in the basement of the building.

Members will be admitted free on exhibition of badge and others will pay the usual entrance fee of twenty-five cents.

Copies of the Report of the Third International Cotton Congress, held at Bemen, may be obtained at the meeting, or will be sent free on application to this Association, Postoffice Box 3672, Boston, Mass.

The Bureau of Manufactures of the Department of Commerce and Labor, Washington, will exhibit at the meeting a large number of samples of cotton goods and yarns sold in the Chinese markets.

Members who have overlooked payment of bills for dues are respectfully requested to give the matter attention.

Members who have overlooked their postal card receipts for Transactions are requested to give the matter attention, as it is only through this means that the headquarters of the Association are able to know that members receive the volumes and notices to which they are entitled, and to keep an accurate record.

It is important that the Association should be promptly informed of changes of address of any members, in order that they may promptly receive their copies of Transactions.

Digitized by Google

The Secretary read the minutes of the last meeting, which on motion of Mr. FRANKLIN W. HOBBS, were approved.

The SECRETARY. Mr. President, I have to announce that at the close of this meeting the following offices will expire by limitation:

PRESIDENT.

JAMES R. MACCOLL.

VICE-PRESIDENTS.

WILLIAM D. HARTSHORNE,
GEORGE A. AYER.

DIRECTORS.

WILLIAM H. LOFTUS,
HENRY F. MANSFIELD.

Mr. HERBERT E. WALMSLEY. I move you, Mr. President, that a committee on nominations be appointed by the chair.

The PRESIDENT. How many shall be in the committee?

Mr. HERBERT E. WALMSLEY. Five.

The motion was seconded and carried.

The President appointed as the committee on nominations: MESSRS. HERBERT E. WALMSLEY, chairman; ROBERT BURGESS, JOHN ECCLES, WILLIAM L. LYALL, and WALTER E. PARKER.

The PRESIDENT. Next in order is the report of the Secretary, Mr. WOODBURY.

Digitized by Google

THE SECRETARY'S REPORT.

The past year has been one of great moment of the Association which has been the natural result of increase in members and also the extension of the field of service which this organization is now able to perform for the interests of its members.

The Board of Government have held seven meetings and kept closely in touch with the varied matters pertaining to the Association which came up for their consideration.

During the year, the Board of Government have carried into effect the instructions of the vote of the last annual meeting and taken the various legal measures for the change of name of this organization, for the third time in its history to conform to the conditions of an ever-widening membership and of what is of more importance to take a name commensurate with the national character of the work of this organization.

In this latter respect the influences of the name of The National Association of Cotton Manufacturers have been most noticeable.

ASSOCIATION MEDAL.

The fifth Association medal last year was awarded to Mr. WILLIAM D. HARTSHORNE for his paper on Some Comparative Data on Moisture in Cotton and Worsted published in the Transactions of the Association, volume 79, page 194, the committee of award being Messrs. CHARLES H. FISH, WALTER E. PARKER, SIDNEY B. PAINE and DANIEL MOORE BATES.

The Board of Government appointed Messrs. CHARLES T. PLUNKETT, SIDNEY B. PAINE, GEORGE A. AYER and CHARLES

Digitized by Google

T. MAIN as the committee on medal for the present meeting at which the decision will be made public by them.

THE STUDENT'S MEDAL.

The student's medal has been awarded to the following members of graduating classes of textile schools designated by the Board of Government, the awards in each case being made to the pupil of the highest rank as determined by committees of members of the Association:

THOMAS WILSON WILLIAMSON, Baltimore, Md., a graduate of the New Bedford Textile School.

HERBERT CHARLES WOOD, Lowell, Mass., a graduate of the Lowell Textile School.

WILEY NESBIT BAGWELL, Auburn, Me., a graduate of the Georgia School of Technology.

LOUIS HART TALCOTT, A. B., Vernon, Conn., a graduate of the Philadelphia Textile School.

The duties connected with the award of these medals imposed exacting tasks upon those members of the awarding committees who made the examinations.

There has also been numerous applications for the medal from other textile schools and textile departments of technical institutions.

With the purpose of equitably meeting both of these conditions, the Board of Government has adopted the report of a special committee of its members which has given thorough consideration to the matter during the past year.

The recommendations of the committee for the standard of a textile school, whose graduating class should compete for a student's medal, and the conditions governing its award are as follows:

That the qualifications required of a school should be,

First—A Suitable Equipment. This to consist of at least cotton carding, spinning, warp preparation, and weaving machinery, in suffi-

Digitized by Google

cient quantity and of suitable assortment to be adapted to giving instruction on cotton manufacturing. The requirements to include a suitable equipment for teaching designing.

Second — Attendance. That there shall be in attendance during the school year for which the medal is awarded at least fifty students enrolled for textile studies, — both day and evening students to be included.

Third — Efficiency. The regular cotton manufacturing day course of the school shall consist of exclusively cotton textile subjects or those which go to build up a general cotton manufacturing course, and shall extend over at least twenty hours per week on an average during each school year, and shall be of the recognized standard.

Fourth — Day and Evening Students Eligible. No medal shall be awarded to any student who has not completed a three years' day course in cotton, carding, spinning, warp preparation, weaving and designing, or its equivalent either in the day or evening, thus allowing day students who do not attend the full three years, and also evening students, the privilege of competing by passing examinations in subjects omitted from the regular course in these studies.

Fifth — Competitors. No medal shall be awarded to any school in any one year unless there are at least four competitors, each of whom shall be qualified as previously stated.

Sixth — School to File Certificate. By January first in each year, the secretary or other officer of each school desiring to enter competition shall file, with the secretary of this Association, a copy of their schedule of studies and a list of students eligible to compete, with a certificate from some executive officer of the institution that the institution is eligible under the previously named conditions.

Seventh — Committee of the Association. The present system of appointing three members of the Association, acting as a committee, to select the successful student at each textile school, shall be abolished.

Eighth — Nomination. In future the principal of each school shall nominate the student whom he considers shall be entitled to receive the student's medal, the suggestions to be approved by the Board of Government, or this Association or by a sub-committee of this Board appointed for that purpose.

Digitized by Google

THE FIRTH SCHOLARSHIP.

A scholarship established in the name of the Association by WILLIAM FIRTH, Esq., sustains a student who will graduate at the New Bedford Textile School in 1908, and therefore this scholarship will not be available for the member, or the son of a member, before that time.

LIFE MEMBERSHIP.

The amendment to the Constitution providing for life membership still continues to commend itself to the members.

During the last fiscal year the following have qualified for life membership by paying one hundred dollars: DANIEL J. DANKER and JOHN P. MARSTON.

MEMBERSHIP.

During the past year the following ten members have died: RICHARD B. BORDEN, CHARLES H. HOBBS, A. E. MCDONALD, THOMAS MAYOR, WILLIAM H. RENNIE, ELWOOD E. TAYLOR, RICHARD THACKERAY, DAVID M. THOMPSON, H. A. TILLINGHAST, M. W. QUINN, biographical sketches of whom have appeared in the last volume of the Transactions or will appear in the one based on the proceedings of this meeting.

There have been seventeen resignations and one dropped for non-payment of dues.

On April 1, 1906, the membership was 797 and during the year 110 have been elected, and with the number of losses as stated above, the membership on April 1, 1907 was 879.

Since April 1 there have been two deaths and six resignations, which, with the ballot for this meeting, containing 91 names, will make the total membership, May 1, 1907, 961.

The following table shows the membership of the Association at various meetings since its foundation in April, 1865, the number elected and the number of present members.

Digitized by Google

MEMBERSHIP OF THE ASSOCIATION.

Number of Meeting	DATE OF MEETING.	Membership.	Number of Present Members	Number Elected to Membership.
1	Apr. 20, 1865, Boston, Mass	.44	2	44
	July 19, 1865, Adj. Meeting,	—	2	42
2	July 18, 1866, Boston, Mass.	72	0	0
3	July 17, 1867, " "	—	1	10
4	Jan. 15, 1868, " "	108	0	32
5	July 15, 1868, " "	—	1	12
	Oct. 21, 1868, Adj. Meeting.	—	2	6
6	Apr. 21, 1869, Boston, Mass.	—	0	19
7	Oct. 20, 1869, " "	—	1	8
8	Apr. 20, 1870, " "	144	0	12
9	Oct. 19, 1870, " "	—	0	5
10	Apr. 19, 1871, " "	—	0	9
11	Oct. 18, 1871, " "	—	1	16
12	Apr. 17, 1872, " "	166	4	29
13	Oct. 16, 1872, " "	—	3	14
14	Apr. 16, 1873, " "	175	1	13
15	Oct. 15, 1873, " "	—	4	17
16	Apr. 15, 1874, " "	189	1	13
17	Oct. 21, 1874, " "	—	0	7
18	Apr. 21, 1875, " "	199	1	13
19	Oct. 27, 1875, " "	—	2	18
20	Apr. 26, 1876, " "	200	1	11
21	Oct. 25, 1876, " "	—	1	13
22	Apr. 25, 1877, " "	213	3	20
23	Oct. 31, 1877, " "	—	2	9
24	Apr. 24, 1878, " "	210	3	8
25	Oct. 30, 1878, " "	—	1	11
26	Apr. 30, 1879, " "	205	3	10
27	Oct. 29, 1879, " "	—	5	16
28	Apr. 28, 1880, " "	219	2	14
29	Oct. 27, 1880, " "	—	1	13
30	Apr. 27, 1881, " "	231	1	11
31	Nov. 30, 1881, " "	—	1	6
32	Apr. 26, 1882, " "	231	2	9
33	Oct. 25, 1882, " "	—	2	5
34	Apr. 25, 1883, " "	240	3	15
35	Oct. 31, 1883, " "	—	2	10
36	Apr. 30, 1884, " "	247	2	9
37	Oct. 29, 1884, " "	—	2	2
38	Apr. 29, 1885, " "	225	2	3
39	Oct. 28, 1885, " "	—	4	8
40	Apr. 28, 1886, " "	225	2	7
41	Oct. 27, 1886, " "	—	4	8

Digitized by Google

Number of Meeting.	DATE OF MEETING.	Membership.	Number of Present Members	Number Elected to Membership.
42	Apr. 27, 1887, Boston, Mass.	234	4	10
43	Oct. 27, 1887, " "	——	2	3
44	Apr. 25, 1888, " "	241	9	15
45	Oct. 31, 1888, " "	——	6	12
46	Apr. 24, 1889, " "	242	3	6
47	Oct. 30, 1889, " "	——	4	8
48	Apr. 30, 1890, " "	246	4	7
49	Oct. 29, 1890, " "	——	6	11
50	Apr. 29, 1891, " "	254	2	4
51	Oct. 28, 1891, " "	——	4	8
52	Apr. 27, 1892, " "	244	9	12
53	Oct. 26, 1892, " "	——	12	19
54	Apr. 26, 1893, " "	259	4	11
55	Oct. 25, 1893, " "	——	6	9
56	Apr. 25, 1894, " "	270	11	16
57	Sept. 27—28, 1894, Crawford House, N. H.	292	12	19
58	Apr. 24—25, 1895, Providence, R. I.	383	56	92
59	Oct. 24—25, 1895, Atlanta, Ga.	422	32	46
60	Apr. 29—30, 1896, Boston, Mass.	450	16	29
61	Sept. 22—24, 1896, Profile House, N. H.	459	13	19
62	Apr. 28—29, 1897, Boston, Mass.	495	29	43
63	Oct. 27—28, 1897, Philadelphia, Pa.	523	23	38
64	Apr. 27—28, 1898, Boston, Mass.	535	17	24
65	Sept. 27—29, 1898, Crawford House, N. H.	554	7	16
66	Apr. 26—27, 1899, Boston, Mass.	564	24	33
67	Oct. 5— 6, 1899, Montreal, P. Q.	580	13	22
68	Apr. 25—26, 1900, Boston, Mass.	603	28	38
69	Oct. 16—18, 1900, Washington, D. C.	628	26	38
70	Apr. 24—25, 1901, Boston, Mass.	647	27	33
71	Sept. 25—26, 1901, Niagara Falls, N. Y.	661	15	19
72	Apr. 23—24, 1902, Boston, Mass.	681	33	42
73	Sept. 30—Oct. 2, 1902, New York, N. Y.	699	19	24
74	Apr. 22—23, 1903, Boston, Mass.	706	36	41
75	Sept. 29—Oct 1, 1903, Lenox, Mass.	723	23	27
76	Apr. 27—28, 1904, Boston, Mass.	744	32	41
77	Sept. 21–22, 1904, Bretton Woods, N. H.	761	23	25
78	Apr. 26–27, 1905, Boston, Mass.	755	35	36
79	Sept. 20–21, 1905, Atlantic City, N. J.	820	71	71
80	April, 25–26, 1906, Boston, Mass.	876	77	79
81	Sept. 12–13, 1906, Lake Champlain.	896	31	31
82	April 24–25, 1907, Boston, Mass.	961	91	91

Digitized by Google

SAMPLES OF ORIENTAL GOODS.

The Bureau of Commerce and Labor has sent to the Association a collection of cotton fabrics obtained from oriental markets which have been loaned to manufacturers during the year and are on exhibition.

After this meeting, the collection is to be returned to Washington.

THE LANCASHIRE COTTON COMMISSION.

The last annual meeting was graced by the presence of members of the Lancashire Private Cotton Investigation Commission, in whose honor the Association gave a banquet, and in common with those of our countrymen who had the opportunity, numerous members of this Association extended to them attentions for the purpose of making the stay of these Englishmen in the United States an agreeable one.

From its published report, and their private correspondence, it is clearly evident that this purpose was accomplished.

THE CONFERENCE OF COTTON GROWERS AND MANUFACTURERS.

On the initiative of President MACCOLL, a conference of those engaged in the growth or manufacture of cotton, including the members of the Lancashire Cotton Commission held a conference at Washington, May 1 and 2.

This Association assumed the expenses of starting the enterprise, and the cost of the meeting was equally shared by this Association, the Southern Cotton Association, the American Cotton Manufacturers' Association, and the Farmers' Educational and Co-operative Union.

Other organizations sending delegates did not share the expenses.

The report of the deliberations of this body cover 325 pages of typewriting, of which copies were made for the above organizations and a few were made for individual subscribers for the cost of copying.

It is not possible to measure the results of such a meeting in

Digitized by Google

terms of precise statistics, but the presidents of the four associations are so fully satisfied upon that point that they have taken measures to hold a second conference at Atlanta, Georgia, October 7 to 9 inclusive.

Invitations will be extended to all interested persons and it is expected that a large number of English and Continental spinners will be present.

TEXTILE EXHIBITS AT THE BOSTON MUSEUM OF FINE ARTS.

The Boston Museum of Fine Arts has the finest collection of textile exhibits in this country, and one of the most complete in the world, and they will give to members of this Association the privilege of examining, drawing or photographing any of these exhibits.

MEETINGS.

This Association has held two meetings during the year at which the technical papers of its members have been supplemented by addresses from guests in public life.

In this respect its course has differed from that usually followed by technical organizations, which limit its papers to contributions furnished by the members.

While the usual course may be a consistent one in a strict construction of principles, yet the demands upon the modern man of affairs whether he be a cotton manufacturer or in any other occupation requiring wisdom to plan and vigor to act, any contribution relating to affairs collateral with his business cannot fail to exert a broadening and energizing influence.

Yet it is essential that the fixed purpose of the Association should always be kept in mind in the organization of a meeting, and proceedings which are discursive in their nature left to surroundings where they may properly belong.

The Transactions of the following societies and periodicals are sent to the Association and kept on file.

Digitized by Google

Transactions of Technical Societies.

American Cotton Manufacturers' Ass'n.,	Charlotte, N. C.
American Society of Civil Engineers,	New York.
Americsn Society of Mech. Engineers,	New York.
American Institute of Elect. Engineers,	New York.
Boston Chamber of Commerce,	Boston.
Bureau of American Republics,	Washington, D. C.
Consular Reports, Bureau of Statistics,	Washington, D. C.
Japan Cotton Spinners' Association,	Osaka, Japan.
National Association of Wool M'frs.,	Boston.
National Electric Light Ass'n.,	New York.
Western Society of Civil Engineers,	Chicago.

List of Periodidals Kept on File.

American Cotton Manufacturer,	Charlotte, N. C.
American Industries,	New York, N. Y.
American Wool and Cotton Reporter,	Boston.
Boston Journal of Commerce,	Boston.
Cassier's Magazine,	New York.
Cotton,	Atlanta.
Cotton,	Manchester, Eng.
Dry Goods Economist,	New York.
Dun's Review,	New York.
Dun's Review, International Edition,	New York.
Engineer,	Chicago.
Engineering Record,	New York.
Fibre and Fabric,	Boston.
Freight,	New York.
Journal of Franklin Institute,	Philadelphia.
Iron Age,	New York.
Lowell Textile Journal,	Lowell.
Machinery,	New York.
Manufacturers' Record,	Baltimore.
Mill and Shop,	Boston.
New England Shoe and Leather Association Monthly Gazette,	Boston.
New York Commercial,	New York.
Power,	New York.
Practical Engineer,	Philadelphia.

Digitized by Google

Protectionist,	Boston.
Technical World,	Chicago.
Textile American,	Boston.
Textile Manufacturers' Journal,	New York.
Textile Recorder,	Manchester, Eng.
Textile World Record,	Boston.

Respectfully submitted,

C. J. H. WOODBURY,
Secretary.

April 24, 1907.

On motion of Mr. D. S. JOHNSTON, it was voted that the Secretary's report be accepted.

The PRESIDENT. The report of the Treasurer is next in order.

Digitized by Google

TREASURER'S REPORT.

C. J. H. WOODBURY, TREASURER, IN ACCOUNT WITH THE NATIONAL ASSOCIATION OF COTTON MANUFACTURERS.

April 1, 1906 to April 1, 1907.

DEBTORS.

Cash on hand April 1, 1906,	$126 93	
Life membership dues,	300 00	
Active membership dues,	3,174 70	
Associate membership dues,	1,710 00	
Active admission fees,	740 00	
Associate admission fees,	675 00	
Interest,	157 66	
Sale of Transactions,	413 00	
Telephone,	20	
Advertising,	1,120 00	
Cotton growers and manufacturers,	170 37	
Loan (less discount),	746 25	
		$9,334 11

CREDITORS.

Board of Government,	$372 56	
Office rent,	399 96	
Secretary and Treasurer,	2,000 04	
Reports of meetings,	129 75	
Notices and stationery,	329 32	
Amount forward,		$3,231 63

Digitized by Google

Brought forward,	$3,231 63	
Meeting expenses,	86 02	
Printing and distributing Transactions,	2,936 97	
Engraving,	51 08	
Badges,	108 75	
Change of name of Association,	100 38	
Loan,	750 00	
Miscellaneous,	41 38	
Postage, telephone and express,	140 65	
Advance copies of papers,	579 70	
Office supplies and furniture,	14 00	
Stenographer and proof,	777 66	
Medals and certificates of membership,	150 04	
Cotton growers and manufacturers,	341 83	
Cash on hand April 1, 1907,	24 02	
		$9,334 11

The Association now holds the following funds for the specific purposes as set forth, and the income during the past fiscal year is as follows:

	PRINCIPAL.	INCOME.
Life membership fund,	$1,400 00	$55 64
Associate medal and certificate fund,	1,000 00	46 37
Student's medal fund, (Donation of Moses Pierce),	200 00	9 28
Library fund, (Bequest of George W. Weeks),	1,000 00	46 37
Textile scholarship fund, (Donation of William Firth),	3,000 00	
	$6,600 00	$157 66

The principal of this fund is held in trust by the Treasurer of the New Bedford Textile School and the income sustains the scholarship in accordance with the provisions of the deed of trust executed by this Association and the New Bedford Textile School, February 20, 1902.

Digitized by Google

The funds of this Association are invested as follows:

Bonds, (market value April 1, 1907, $1,915),	$1,935 11	
Deposited in Savings Bank,	1,364 89	
Deposited in Trust Company,	300 00	
Held in trust by treasurer of the New Bedford Textile School,	3,000 00	
		$6,600 00

AUDITOR'S REPORT.

I hereby certify that the amounts from April 1, 1906, to April 1, 1907, are correctly cast, that all payments are properly vouched for, that the funds are kept on deposit in the name of The National Association of Cotton Manufacturers, and that the amount of the deposit April 1, 1907, agrees with the balance in the books, viz., $24.02.

The securities in which the Association funds have been invested have been examined.

C. E. ROBERTS,
Auditor.

BOSTON, MASS., APRIL 9, 1907.

The earnings of the Association for the year may be placed as:

3 life members at $100,	$300 00	
687 active dues at $5,	3,435 00	
192 associate dues at $10,	1,920 00	
86 active admission at $10,	860 00	
24 associate admissions at $25,	600 00	
Advertising,	1,400 00	
Miscellaneous,	741 23	
		$9,266 23

The disbursements of the year amount to $8,560.09, which is $706.14 less than the earned income.

Accounts receivable:

Active dues and admission,	$780 00	
Associate dues and admission,	470 00	
Advertising,	360 00	
		$1,610 00

Digitized by Google

This amount of accounts receivable is $595.00 more than it was a year ago. This Association pays its bills promptly, but in order to do so, it has been necessary to borrow money for the purpose this year as was also done last year, because delays in paying dues have at times rendered the available resources inadequate for the needs of the Association. This appears to be a condition of affairs which has always existed and yet has never been accounted for, except neglect on the part of many members to pay these bills, as the amount of the annual dues is too small to be such a tax on the resources of any member as to be a cause for delay.

This is the only technical organization holding two meetings a year and issuing illustrated transactions of the same, not to mention other work of this organization, and having dues of the small amounts of this Association. It has been the policy of the Association, not merely that its members should receive the amount of dues in expenditures for their benefit but that the whole income should reasonably be applied for them. During the past year the expenditures of the Association were $2,260.39 in excess of the amount received for membership dues, and also admission fees, that is to say, the members received from the Association what cost 36 per cent. more than the amount which they paid to the Association.

There are no bills payable.

The income derived from advertisements has enabled the Association to be conducted on the same basis as other technical organizations which are supported by higher assessments as well as by advertisements in their transactions. The receipts from this source have amounted in the several volumes of the Transactions to:

63	Philadelphia, October, 1897,	$385 00
64	Boston, April, 1898,	420 00
65	Crawford House, September, 1898,	450 00
66	Boston, April, 1899,	550 00
67	Montreal, October, 1899,	445 00
68	Boston, April, 1900,	580 00

Digitized by Google

69	Washington, October, 1900,	$665 00
70	Boston, April, 1901,	620 00
71	Pan-American, September, 1901,	595 00
72	Boston, April, 1902,	575 00
73	New York, September — October, 1902,	645 00
74	Boston, April, 1903,	745 00
75	Lenox, September — October, 1903,	705 00
76	Boston, April, 1904,	616 00
77	Bretton Woods, September, 1904,	650 00
78	Boston, April, 1905,	460 00
79	Atlantic City, September, 1905,	620 00
80	Boston, April, 1906,	715 00
81	Lake Champlain, September, 1906.	685 00
82	Boston, April, 1907, (already under contract),	470 00

The following table presents the finances of the Association for the past seventeen years:

Digitized by Google

MEMBERSHIP.			TRANSACTIONS.			FINANCES.				
Fiscal Year Ending April 1.	Enrollment.	Members Elected.	Volume Number.	Pages in Volume.	Pages for Year.	Cash Receipts.	Expenses.	Cost per Page of Transactions.	Cost per Member.	Cost per Page of Transactions for each member Cents.
1891	246	18	48 49	43 62	105	$1,142 00	$ 926 08	$8 82	$3 76	3.59
1892	254	12	50 51	129 60	189	1,260 68	1,374 46	7 27	5 41	2.86
1893	244	31	52 53	63 94	157	1,678 33	1,603 25	12 22	6 57	6.33
1894	259	19	54 55	84 86	170	1,414 58	1,807 60	10 63	7 03	4.14
1895	270 292	35	56 57	73 230	303	1,947 07	1,957 64	6 46	6 71	2.21
1896	384 422	142	58 59	310 327	637	4,579 19	3,636 31	5 71	8 59	1.34
1897	450 459	49	60 61	269 359	628	3,710 02	3,980 34	6 33	8 67	1.43
1898	495 523	83	62 63	353 453	806	4,717 08	4,333 85	5 38	8 28	1.18
1899	535 554	42	64 65	321 380	701	4,713 56	4,775 97	6 81	8 62	1.23
1900	564 580	56	66 67	464 296	760	5,237 53	5,007 23	6 57	8 63	1.14
1901	603 628	78	68 69	382 476	858	6,331 93	6,295 55	7 34	10 02	1.16
1902	647 661	52	70 71	366 379	745	6,724 23	6,035 84	8 10	9 13	1.22
1903	681 699	66	72 73	342 415	757	6,768 81	6,701 65	8 85	9 58	1.26
1904	706 723	68	74 75	512 374	886	6,794 50	6,848 75	7 73	9 47	1.07
1905	744 761	66	76 77	376 313	689	7,080 31	6,797 04	9 86	8 93	1.29
1906	755 819	107	78 79	382 337	719	8,209 56	7,555 67	10 51	9 23	1.35
1907	876 896	110	80 81	429 387	816	9,060 93	8,560 09	10 49	9 55	1.17

Respectfully submitted,

C. J. H. WOODBURY,

Treasurer.

April 9, 1907.

Digitized by Google

On motion of Mr. WILLIAM D. HARTSHORNE, it was voted that the reports of the Treasurer and Auditor be accepted.

The PRESIDENT. The awarding of the Association medal, by Mr. CHARLES T. PLUNKETT, Chairman of the committee, is now in order.

Mr. CHARLES T. PLUNKETT. On behalf of my associates, I beg to present the following:

REPORT OF THE ASSOCIATION MEDAL COMMITTEE.

Mr. President, the committee appointed to award the Association medal for the year 1906, consisting of CHARLES T. MAIN, SIDNEY B. PAINE, GEORGE A. AYER and myself, in accordance with the provisions governing the bestowal of this token of merit, submits its reasons for reaching what would, we believe, have been a unanimous conclusion of its members, had Mr. PAINE been disassociated with the recipient-elect.

Nineteen centuries intervened between the aeolipile or rotary engine of Hero of Alexander and the crude reciprocating engine of JAMES WATT, which thereafter held undisputed sway in the field of steam motors for a hundred years, notwithstanding the turbine principle applied to water wheels reached the climax of its efficiency during the same period.

Approximately twenty years have elapsed since DELAVAL and PARSONS, combining the energy of expanding steam and the sequential vacuum, produced commercially successful steam turbines. Yet the consumers of power have remained, until recently, in ignorance of the marvelous progress in this type of motor owing to the paucity of accurate and comprehensive information.

In our judgment, there has been during the past year nothing of record in the "Transactions" of this Association, nor in the nature of inventions which better deserves the distinction of highest place among the contributions to the science and business of cotton manufacturing than the consumately prepared paper of Mr. CHARLES B. BURLEIGH, read at the Fall meeting at hotel Champlain, upon the Curtis Vertical Steam Turbine. [Applause.]

Addressing Mr. BURLEIGH:

It is particularly gratifying, Mr. BURLEIGH, to present to you, in this hall, the medal which is yours because you have excelled in the techni-

Digitized by Google

cal as well as the utilitarian phases of a subject of inestimable importance to the great industry represented here by many alert, practical and discriminating manufacturers and managers who are indebted to you.

Mr. CHARLES B. BURLEIGH. Mr. President, Mr. Chairman, and members of The National Association of Cotton Manufacturers: It is with a most profound sense of gratitude and obligation that I accept this great honor at your hands, and in doing so I am reminded of a charge given me by my deceased father. He said, "My boy, be positive that you merit your own respect and you will always be in a position to demand the respect of others." Gentlemen, you will appreciate my deep sense of gratitude and wonder if this great honor can be justly merited when I assure you that you have conferred upon me greater honor than I ever dared to credit to myself. I thank you most sincerely. [Applause.]

The PRESIDENT. Gentlemen, it is a pleasant surprise to many of us to find that we are once more to receive a welcome from a gentlemen who is one of our honorary members, and who in addition to the other work that he has undertaken, is still the president of the Massachusetts Institute of Technology, Dr. HENRY SMITH PRITCHETT. [Applause.]

Digitized by Google

WELCOME TO THE INSTITUTE.

HENRY SMITH PRITCHETT, LL.D., President Massachusetts Institute of Technology.

Mr. President and Gentlemen of The National Association of Cotton Manufacturers: I count it equally a pleasure to me to be able to extend to you once more the greetings and the cordial welcome of the Institute of Technology. As I have said to you two or three times on similar occasions, there is no body of gentlemen who would be more cordially welcome than you who represent this great industry. I always appreciate this occasion anew for the reason that it implies at least a connection between education and industry, between manufacture and training.

You are a national association, the Institute of Technology is in a sense a national institute, but I think both your Association and our college have pretty strong interests in New England. Now, I believe that New England cannot get along without education, but I do not believe it can live on education or on its educational institutions. The prosperity of our section and of our country is, in my judgment, inevitably bound up with the marriage of education and industry. We have got to make in New England our education and our science practically serve our industry and our manufacture if we are to be prosperous and if we are to maintain our supremacy; and I always feel that such a gathering as this, such a coming together of a great body representing a great industry of this section and of this country, to an educational institution, is at any rate a reminder once a

Digitized by Google

year of that problem — the problem of making science and education serve directly, practically, efficiently, manufacture and industry.

Massachusetts has always been hospitable alike to industry and education. We have had a deal of talk the last few weeks about a certain movement in the General Court of Massachusetts which looks toward the taxation of certain forms of college property. I should be sorry to see that movement become a large one because I consider that the taxation even of college residences is a blow to education — is a burden upon education; and I consider, although we have no residences for professors or for president in the Institute of Technology, that a residence furnishes as real a part of the educational system as does a laboratory or a recitation room. There is no finer lesson for these young men to learn today than the serious and fine art of living together, and there is no part of the educational work of an institution better than that which can be had by professor and student living side by side day by day and month by month.

I do not believe that this movement represents any real sentiment on the part of the Commonwealth of Massachusetts. I believe that she is hospitable alike to education and to industry and that she realizes that in their mutual service lies her own prosperity.

My greeting this morning is necessarily a brief one to you. I hope it may be none the less cordial, none the less hearty, because it is brief. But before I sit down I venture to refer to one other phase of the relation of education to industry which seems to me at this time pressing and important. In this country we have done much for the high-grade engineer, for the training of the man in the technical school of engineering. We have done very little for the boy who is to leave the school at the age of fourteen and make his own way, and those boys who leave the grammar school at the age of fourteen to find their way in the world compose 95 per cent. of all those who enter the public schools. Our apprentice system has practically

Digitized by Google

gone, as you know. Americans are no longer trained to be skilled journeymen and to be skilled workmen in the apprentice system of this country to any large extent. Therefore it seems to me clear that the great industrial educational problem of today is not so much the problem of the higher class engineer as it is the problem of dealing with this fourteen-year-old boy who goes out of the grammar school with no opportunity as an apprentice and no opportunity to learn the elements of a trade, of a craft or of an industry. Some way or other we must find means to combine a practical school of industry with our public school system, so that this great mass of American youth may find the opportunity to learn the elements of a trade and of an industry.

There has been more or less opposition to the industrial school in the past on the ground that it sent a great number of men into the trades who thought themselves to be journeymen, to be skilled workmen, when they were not. I think this is a misapprehension. The same sort of complaint was made in the early days and is sometimes made now about the engineering school. Men complain that the men who go out from the Institute of Technology are not engineers. Now, the fact is they are not engineers, and we take the greatest trouble in the Institute of Technology to make these young men understand that they are not engineers when they leave us; that they are only ready to be engineers, and that they become engineers when they have had practical experience in their own profession. They start not as engineers, but they start at the foot of the ladder on the wages of a day laborer. Now, your industrially trained boy must do the same thing. He must go into these callings, into these trades, not as a skilled workman, but he must go as a man who has had a theoretical training which will make him a skilled workman in a short time, and in proportion as he comes to you men with that preparation. We who are in the educational work of this country feel that it is to the interest both of the employer and of the representative of organized labor to give to that boy, when he does come, the

Digitized by Google

opportunity to perfect himself in the practical side of his trade and in the practical side of his industry. Some way or other there must be found a means to give to the youth of America the chance to learn a trade, and then there must be found a broad enough spirit on the part of all who are interested in trade and industry to give the boy a chance to learn the elements of his trade in practice. This, to my thinking, is the point today upon which education and industry and manufacture touch most closely and in which they can serve each other best.

Let us renew the word with which I started. I am here only as the representative of the Institute of Technology, a great school sending men into the service of this state and of this nation, to greet you men who are in the active work of industry and of manufacture. A man said to me the other day, "If your school was only rightly run on business principles, instead of showing a deficit each year, you could declare a dividend." "Why," I said, "my dear sir, the Institute of Technology declares a dividend every year. It sends between two hundred and three hundred well-equipped men into the service of the Commonwealth of Massachusetts and into the service of the nation. That is a dividend which cannot be measured by dollars or cents, but it is a real dividend and a real asset."

We welcome you here as men who are taking up this product, who are giving it the opportunity to become useful, and who equally with us are interested in making education not only real but effective, making education not only serve the spiritual interests of this Commonwealth, but its material interests as well, and in that commonwealth of education and of industry we bid you here a hearty welcome on behalf of the Institute of Technology. [Applause.]

The PRESIDENT. The head of a great municipality has continual calls upon his time, and we therefore appreciate highly the kindness of the mayor of Boston in coming here this morn-

Digitized by Google

ing to extend to us words of welcome in behalf of the city. I have pleasure in introducing to you his Honor, JOHN F. FITZGERALD, Mayor of Boston. [Applause.]

Digitized by Google

WELCOME TO THE CITY.

Hon. JOHN F. FITZGERALD, Mayor of Boston.

Mr. President, and members of the National Association of Cotton Manufacturers: I know that I bespeak the sentiments of every citizen of Boston when I welcome you here to this city and to this convention hall, and express the hope that your deliberations here may result in a splendid benefit not only to us here in Massachusetts, but to all the people of the country, and, I may add, to the people of the world. Cotton manufacture is the principal industry of Massachusetts, as you know, and although Boston is the largest manufacturing city in the state, I do not believe that there is a single cotton manufacturing establishment within the limits of our city, but we all here take a very deep interest in the success of this industry because of what it accomplishes for the welfare of the people of the state, whom the people of Boston are vitally interested in, because we are the metropolitan city of Massachusetts, and of New England.

I believe that 12 per cent. of the product of our manufactures in this state today is cotton. I believe that 18 per cent. of the wages earned in manufacturing lines is for cotton goods. I believe that the product of cotton manufactures in the Commonwealth today amounts to between $130,000,000 and $140,000,000. I understand that the State of Massachusetts manufactures three times as much cotton goods as any other state in the Union, and for that reason of course the City of Boston is vitally interested in the success of the cotton manufacturing enterprise, and the people of the City of Boston of course were

Digitized by Google

very anxious and very willing that the Mayor of the city should come here this morning and officially extend the courtesies of this city to you.

I applaud the words of President PRITCHETT, who I am always very glad and willing to work with, because he is one of our foremost and most public-spirited citizens; and I applaud his words here upon the platform this morning, when he called attention to the condition of affairs in Massachusetts today, when it is seriously proposed to place additional burdens upon our colleges and upon our institutions. As he well said in his address, of course it is impossible for Massachusetts to succeed because of the success and the number of educational institutions, but if that education and science are applied to manufact uring here, the future of Massachusetts lies in that direction; so that every handicap placed upon our educational institutions is a distinct handicap to manufacturing enterprises.

I did what I could the other day with the Boston members of the Senate, and I want to say to their credit that they unanimously voted against the proposal to tax the residences of college professors, and voted against the proposition as a whole; and I think that the members of an organization of this kind ought to seriously consider the situation and see if you too cannot become an agency in stopping the passage of this obnoxious measure. When we consider the fact, gentlemen, that college professors are educated men, that they are men who have gone through the preparatory schools, who have gone through the colleges, and, as a general rule are the brainiest and the best men in the United States, who consecrate their lives to the education of the youth of the country, whose salaries necessarily can never reach more than $8,000 or $9,000 a year, and as a general average are not more than $5,000 or $6,000 a year, while men with no better equipment, and most of them with a far inferior equipment, command salaries of $100,000 and $150,000, and $200,000, and in this country today some of them have become billionaires, while these men have consecrated themselves to the education of the youth of the country,

Digitized by Google

yet it is seriously considered in the Massachusetts Legislature today to place an additional handicap not only upon those men but upon the institutions which they are sworn to serve. I do hope, in the interest of successful manufacturing enterprises here in Massachusetts, because of the relation which exists between education and manufacturing here, which has been so very well shown by the remarks of President PRITCHETT, that this organization will go on record against that measure, and say so to the Massachusetts Senate and to the Massachusetts House of Representatives. [Applause.]

Now, gentlemen, another word. I believe thoroughly in what President PRITCHETT says. The figures which he gave here this morning, if they impressed themselves upon your minds, as I hope they will, must make a strong impression. Ninety-five per cent. of the boys that come out of our schools here in Massachusetts today are untrained and unskilled. What is going to become of Massachusetts under conditions of that kind? It is true that our cotton manufacturing business has been financially prosperous the last year, or last year and a half, but I can remember when I was a member of Congress, I had many talks with Mr. LOVERING about the matter, that things did not look so bright for us here in Massachusetts and New England, and I was one of the few men that he could rely upon for support when he introduced his resolution calling for the appointment of a commission to go to China and investigate conditions in the far East with a view of developing the trade of the United States. Although we fought for that measure during two sessions of Congress hard and persistently, we were hardly able to gather a score of votes outside of those representing the New England states. And I thought at that time, gentlemen, to be plain about the matter, that we did not receive practical co-operation on the part of the cotton manufacturers of the country, particularly in the line of educating the members of Congress to the necessity and the urgency of the development of the trade in the far East. I talked with Mr. LOVERING, as I have said, upon cotton manufacturing in New England, and he said that

Digitized by Google

the hope of New England at that time must rest on the bettering of the product that came out from the mills. I remember conversations with him and with other men which led me to believe that the New England cotton manufacturers did not keep up with the times in the matter of improving machinery. I talked with the Mayor of Lowell three years ago about the situation, and he said there would be no trouble about conditions in Lowell if the machinery used in Lowell was kept to the proper standard.

I know also that a great deal of complaint was made because the cotton manufacturers did not co-operate with the educational authorities in cities like Lowell and Fall River and other cities in the country, so that science and education might go side by side with practical manufacturing. I do not think it is to our credit in this Commonwealth today, considering the length of time that the cotton manufacturing industry has existed here, that Great Britain, though we grow 80 per cent. the cotton of the world, exports more cotton manufacture dgoods than the United States manufactures. It seems to me that in this great big city of Boston, with its splendid water front and its magnificent railroad facilities and the splendid opportunity that we possess here to furnish every kind of labor in the cotton manufactures of Massachusetts and New England, we should encourage some movement that would lead to the building of a cotton manufacturing plant that would manufacture better cotton goods than in any other portion of the country; and, as practical men, not alone looking for the success of your own industry, you see these figures which President PRITCHETT has given out here today show that the boys who come out of the schools today know nothing about any trade, know nothing about any business, know nothing about any enterprise, as he said, and the labor makes it impossible for them to become electricians, makes it impossible for them to become printers, to become plumbers, to learn a trade of any kind, and yet, until Governor DOUGLAS wrote his famous message calling the attention of the people of the Commonwealth to our lack in the matter of tech-

Digitized by Google

nical and business education, not a single word was said about it.

My point is here, gentlemen, that I think that movements of that kind ought to be led by organizations like this; that it is your business, when you find competition coming in North Carolina and in South Carolina and other sections of the country, in the coarser goods, making it impossible for the Northern states to compete with them in that class of manufacture, to become acquainted with the systems of education, with the conditions of the schools and see if there isn't some way, as the president suggested a few moments ago for the educational authorities and for the manufacturers of New England to get together and not only of New England but for the manufacturers of the South and every section of the country, to see if we cannot get some of the trade which is now held by England.

I have a great deal of confidence, gentlemen, in the future of the United Siates. I might say that I have unlimited confidence in the ability of the United States to get the cotton manufacturing business of the world. I had the honor to serve in Washington for six years and I came in contact with the very live, wideawake representatives from the West. I attended a few months ago the River and Harbor Convention in Washington and there were fifty delegates from Louisiana, seventy from Mississippi and that hall was crowded to the doors with live, wideawake men, who wanted the waterways of the United States developed. When we find Mr. HILL, the great railroad president, saying that it will be necessary for this country to spend five billions of dollars in equiping the railroads to do the present business of the United States, it shows, gentlemen, the urgency that there is on the part of every one of you men, and every man interested in the development of the commerce and industry and the manufacturers of the United States, to find new means of transporting our goods from one section of the country to the other; because this trade which England possesses now, which, as I said a moment ago, in exports amounts to a larger product than we manufacture, can never be success-

Digitized by Google

fully taken away as long as our means of transportation are infantile and not creditable to a fourth class nation. Five billions of dollars are necessary to equip our railroads to transport our cotton and practically no attempt except in the last few years to increase the output that may be taken along our waterways. Germany, England and France have been developing their waterways for half a century, and we have been talking about building a canal through Cape Cod for two hundred and fifty years and it has not been done yet. [Laughter and applause.] They have been talking about developing the Mississippi River for one hundred years and practically nothing has been done up to the present time. I do hope, gentlemen — I don't know what the programme of your deliberations will call for — that some attention will be paid by this organization to the development of the waterways of the United States, so that we can hope to get some of the trade which England now controls.

Last year the United States, gentlemen, produced 23 per cent. of the gold found in the world. We produced 33 per cent. of the silver, we produced 50 per cent. of the oil, we produced 55 per cent. of the copper, we produced more than 70 per cent. of the cotton and 85 per cent. of the corn and the commerce carried on between the forty-five states of the United States on inland waterways was greater than the international commerce of the world. The United States is growing rich at the rate of $10,000,000 a day, against $700,000 on the part of Great Britain, our next competitor. So that, gentlemen, there is every reason to believe that the manufacturers of the United States and every man engaged in industry and manufacture and commerce, has a better chance in this country than in any other part of the world. All we have to do, whether it is New England or the South or the West, is to adopt modern methods; to follow Germany, and adapt education to manufacture and manufacture to education; and twenty-five years from now the United States will not only be supreme as an agricultural nation, but we will be sending our products to every point of the world, more so than all nations combined. [Applause.]

Digitized by Google

The PRESIDENT. On behalf of the Association, I wish to extend our most cordial thanks to President PRITCHETT and to Mayor FITZGERALD for their presence this morning, for the words of welcome that they have spoken to us, and the valuable and most interesting addresses that they have delivered. We appreciate very highly indeed what they have done for us. [Applause].

The PRESIDENT. The Secretary will read the names of the committee on resolutions as appointed by the chair.

The Secretary announced the appointment by the chair of the following committee on resolutions: FRANKLIN W. HOBBS, ARTHUR H. LOWE, GEORGE A. AYER, THOMAS G. COX and SIDNEY B. PAINE.

The PRESIDENT. Before proceeding further I would like to make a request. Following my address there are three addresses on important topics to be delivered by prominent gentlemen who have honored us with their presence this morning. I hope that every member, every one present, will try and remain to the end of the session. We shall endeavor to close by one o'clock or a few minutes after, and I hope that there will be a general acquiescence in this request and that everyone will stay to the close.

Digitized by Google

PRESIDENT'S ADDRESS.

JAMES R. MACCOLL, Providence, R. I.

I am glad to congratulate you upon the continued activity and prosperity of our industry. This condition seems to be world-wide. There is adequate consumption, or at least demand, to employ every spindle and loom. A year ago we recorded England's increase of 6,250,000 spindles. The latest reports show 10,000,000 spindles added or projected within five years, which equals the growth of the previous thirty years. In our own country there has been a normal addition of spindles; imports of cotton manufactures have increased during 1906 as compared with 1905, $14,500,000, or 26 per cent.; exports have diminished $13,500,000, or 24 per cent.; yet there is no evidence of over supply or glutted markets. Extension of foreign trade is for the moment ignored, on account of the home demand absorbing all the output.

There are frequent questionings as to how long this condition may continue. It is evident that the great nations of the world are bound together more closely than ever before in their commercial affairs, and that extreme activity or depression must generally be world-wide. An insufficient demand for the product of England's 56,000,000 spindles will quickly produce lower prices, which will enable many classes of goods to be landed in this country at a cost much below the present level of American production. Recent reports from American consuls and special agents in Europe show that wages in the building trade are three times higher here than in Europe. This affects materially the cost of building new plants. These reports

Digitized by Google

also show that the wages of American textile operatives are in many classes of work more than double the European standard. Everything that enters into the cost of production is getting on to an excessively high level. It is hardly to be expected that the present tariff can prevent large importations of foreign goods, unless we can maintain our lead in the use of labor-saving methods and devices. But the fact is, that our foreign competitors are keenly alive to the situation, and are rapidly adopting American improvements, and there are already many mills abroad that are fully equipped with every American device. Special Agent WHITTAM, writing from England recently, emphasizes this point when he says, "As showing the progress in manufacturing methods, in 1882 it was computed that an average spinning mill employed 5.71 workers to each thousand spindles. In 1893 this had dropped to 4.86 persons, while in the modern mills today 2½ hands per thousand spindles is considered a maximum." As soon, therefore, as there is a reaction abroad, we may expect a reaction here.

The raw material has furnished more than its usual contribution to the problems of the cotton manufacturer during the last six months. The remarkable storms of September and October had a disastrous effect on the crop, especially in the Mississippi delta. As regards staple and grade, what promised to be a large and splendid crop was suddenly changed to a crop both inadequate and unsatisfactory. The result has been an advance of 50 to 100 per cent. in the price of staple cottons of good grade. Many mills have had to substitute Egyptian for American cotton, and some are using lower grades than they ever before attempted. Shippers who sold cotton at "points on," have, in many cases, lost heavily in filling their contracts, and it is probable that this method of selling cotton, with the inadequate hedge which the future market offers, will be curtailed materially in the coming season. From the mill standpoint, the result of the storms may be beneficial in teaching manufacturers how to use lower grade cotton.

The congestion of cotton at compress and shipping points

Digitized by Google

has during the present season been unprecedented. It is apparent that compress and railroad facilities are entirely inadequate for a crop of 14,000,000 bales, and the demands of the world will be far in excess of that amount at no distant date. The remedy is to be found in equipping ginneries with presses that are capable of producing bales with a density of 35 to 40 pounds per cubic foot. The economy in cars would be enormous, compared with the present system, under which cotton is loosely packed at the ginneries, transferred to compresses, unloaded, and then reloaded after compressing.

The delay in transit to the mills is excessive. An average of two to three months is required to bring cotton from the South to New England mills. In some instances railroads have issued bills of lading on presentation of compress receipts, without the cotton being actually in their possession. A prominent English spinner informs me that bills of lading have been received in England for cotton shipped in a specified steamer, and on being traced, the cotton was found months after at interior towns in Texas. Such a system is fraudulent, and should be stopped by an appeal to the Interstate Commerce Commission or by action in the Federal courts.

The principle of reciprocal demurrage seems to be just, namely, that if the railroad charges consignees for delay in emptying cars, the consignee should have the right to charge railroads for dilatoriness in forwarding and delivering. Why should manufacturers have to lose several months' interest on cotton payments through unnecessary railroad delay, and at the same time be subjected to serious inconvenience in the management of their business?

I have earnestly advocated during the last two years, closer relations between growers and manufacturers, because it seems to me that only in this way can improvements be brought about in the handling, baling, and marketing of our raw material. I have received many letters from organizations and individual planters in the South, asking for information as to the requirements of the spinners, and stating their desire to supply what

Digitized by Google

the spinners want, and to get into closer touch with them. It is proposed to hold a second conference in Atlanta on October 7th, 8th, and 9th of this year. There will probably be an important delegation present from Europe, and arrangements are being made for a special trip through the cotton states for the benefit both of foreign and American manufacturers. The following are some of the subjects that may be discussed: Improved ginning and compressing, uniformity of bales, tare, moisture, warehouses, transportation, uniform classification, buying on net weight, cotton contracts of various exchanges, stability of price, closer trade relations between growers and manufacturers, government crop reports.

It is believed by the officials of the Southern Cotton Association and Farmers' Educational Union that a large number of planters will attend the conference, and that by meeting spinners in a friendly way and learning their needs, stimulation will be given to the forward movement in the South. The cordial co-operation in this meeting of all cotton growing and manufacturing associations, as well as cotton exchanges, is earnestly desired.

There is a widely prevalent and frequently expressed opinion among growers that manufacturers are antagonistic to their interests, and are continually conspiring and working to lower the price of cotton. It must be admitted that each individual manufacturer desires to buy his cotton at the lowest price of the season, just as the grower who purchases cotton cloth tries to make the best bargain he can. But this is entirely different from desiring or advocating low prices for the great Southern product. The interests of the New England manufacturer are all in favor of high-priced cotton. It means prosperity to the South, and therefore greater purchasing power for the output of Northern looms. The higher prices must also be paid by the foreign buyer, who takes sixty per cent. of the output, and thereby the balance of trade in our favor as a nation is increased. High-priced cotton adds to the duty on many classes of goods, and thus strengthens the domestic manufacturer's

Digitized by Google

position in competition with his foreign rival. Once for all, we say to the Southern grower,—Get all you can for your cotton; the more you get, the better we are pleased.

It should, however, be continually advocated as a sound rule of business and economics, that the cotton grower, by the adoption of every possible improvement, should seek to lower the cost of producing his cotton. The cheaper the material, the larger the volume of business that can be done. It is twice as profitable for the planter to grow a bale per acre, costing eight cents per pound and selling at ten cents, as it is to grow half a bale per acre, costing ten cents and selling at twelve cents per pound.

It seems to me a patriotic duty to urge and encourage the growth of sufficient cotton in our Southern states to supply the world's requirements, and thus to discourage the attempts being made to raise cotton in Africa, Asia, and elsewhere. The foreign and American spinner are in exactly the same position, and have the same rights and opportunities in purchasing the Southern cotton crop. If the foreign spinner should see fit to buy land in the South and grow cotton there, is it not more advantageous to this country than it would be to have him carry on the same business in West Africa? Some of the members of the English Commission, who were with us a year ago, came here again in the fall, and made further investigations at the season when the crop was being picked and ginned. In connection with their purpose to start cotton growing, it has been urged that the States should enact new laws to prevent any alien corporation from owning land for the purpose of raising cotton. It is merely a technical question whether such corporations shall be alien or domestic, but the thing itself should not be discouraged by any such talk. By all means let foreign capital come and grow cotton if it wants to.

The second report of the British Cotton Growing Association is a story of failure in some quarters and of marked success in others. In general the outlook is optimistic, provided enough financial support is received during the next few years. The subscribed capital has been increased $300,000 during the year. The following extracts from the report may be of interest:

Digitized by Google

"As will be seen from the report, the Indian government is now thoroughly aroused to the necessity of action; in the West Indies, cotton growing is established on a sound commercial basis, and the production this year is estimated to reach £100,000 in value * * * * * *

* * * * * * *

"The Council are strongly of opinion that a turning point has now been reached. The time for mere experiments has passed. The case is proved. All the cotton Lancashire requires can be grown within the limits of the Empire * * * * * * * * * * * * * *

* * * * * * *

"It will be noticed from the above figures that the industry has practically doubled itself in each of the last four years. If this rate of progress be maintained, in 1910 Lagos will export 100,000 bales of cotton, worth £1,000,000, an amount equal in value to the whole of her present exports; and in this one colony alone the Association will have attained in less than eight years what it took the whole of the cotton states of America considerably over ten years to achieve, viz., to produce an annual crop of 100,000 bales."

It was a tactical mistake on the part of cotton growing interests to attempt to secure a postal fraud order against the New York Cotton Exchange. This institution has a high record, its rules require strictly honorable dealing, and its members are generally men of first-class commercial standing and integrity. There should, however, be no objection to the investigation ordered by Congress to be conducted by the Bureau of Corporations, especially as it includes not only cotton exchanges, but cotton growing and manufacturing associations.

Fault is found with the New York contract, because in fixing the differences on tenderable grades only once or twice a year, it inclines to produce a wide variation between contracts and spots. The principle seems to be this: If differences are arbitrary as in New York, then adjustment of value on the most undesirable grades, which of course will always be tendered, must be in the contract price; but if differences are adjusted

Digitized by Google

continually by market conditions, as in Liverpool and New Orleans, then the contract price will remain in more uniform relation to spots. We are fortunate in that we are to have a paper, delivered at this meeting by an ex-President of the New York Cotton Exchange, in which this problem is fully discussed.

Exception, also, is taken to the cotton tendered on contract being of no use to spinners, on account of the variety of grades in each one hundred bales, and also the lack of uniformity of staple. It is unquestionable that contracts are used only for hedges or speculation and are not intended for delivery to spinners. In a recent circular, issued by one of the oldest houses of the New York Cotton Exchange, the following sentence occurs: "More or less has been said about having a contract that would be taken up by spinners. This is a fallacy, as the mills require a specific grade. The Lancashire spinners do not expect delivery on Liverpool contracts. A leading buying brokerage house there states that they have not taken delivery of over 1,000-bales contract cotton in six years." The following questions are worthy of consideration and discussion: Could the legitimate cotton business of the world be carried on more advantageously without any future contract market, and the hedging which that provides? Would speculation be materially reduced if the contract market were abolished? Can the future contract be adapted to the actual requirements of spinners? Should differences in the tenderable grades be continually adjusted, or remain comparatively fixed by only an annual adjustment?

In my opinion, the time has come when a cotton exchange should be established in New England, where two-thirds of the spindles of this country are located. With their excellent port and railroad facilities, either Boston or Providence should grasp the opportunity that is presented. Such an organization should embody the best ideas and methods of all the cotton exchanges of the world. As in Bremen, the membership should be composed of both cotton merchants and manufacturers. The remarkable success of the Bremen exchange is largely attributed

Digitized by Google

to this joint co-operation for mutual advantage. The establishment of fixed standards of grade and staple, and a system of arbitration by sworn classers would be of great value to New England spinners. In Bremen, actual cotton is ordered for future delivery, and out of nearly 2,000,000 bales imported in 1905, ninety-two per cent. were arbitrated on arrival by the sworn classers of the exchange. This method would save a vast amount of trouble and expense at the mills, and would result, not only in economy, but also in obtaining more reliable and uniform supplies of the raw material. The cost of classification in Bremen is about six cents per bale.

The spot feature of the Liverpool market could be developed. With the changed and changing conditions in the South, a concentrated stock of spot cotton in New England would be of inestimable benefit to our factories. In point of time, Boston or Providence is as far as Liverpool from our southern cotton markets. In Liverpool, the stock of spot cotton frequently amounts to 500,000, and sometimes to 1,000,000 bales, and the English spinner can go to Liverpool at almost any time and find what he needs. With regular steamer communication between Southern and New England ports, carrying cotton one way and taking back New England manufactures, and the existence here of a great central reservoir of the raw material, in my judgment there would be an important economy of money and time.

Another feature might be a future contract market, dealing in spinnable cotton, that is to say, cotton, which in each 100-bale contract is practically uniform in grade and staple, the differences on deliverable grades being regulated by actual market values. The cotton industry of New England will undoubtedly have tremendous growth and expansion in the years to come. A local cotton market and exchange would be a leading factor in this development, and would also add greatly to the commercial importance and prosperity of the city which adopts it. Such a movement would require the enthusiastic help of bankers, manufacturers and merchants, but it would be far-reaching in its possibilities and results.

Digitized by Google

An insufficient supply of labor exists in some parts of the country, and there has therefore been keen interest in the efforts made by southern states to import labor as permitted under Section VI. of the Immigration Act, which reads, "Provided that this section shall not apply to the states or territories, the District of Columbia, or places subject to the jurisdiction of the United States, advertising the inducements they offer for immigration thereto, respectively." North and South Carolina each appointed a Commissioner of Immigration, considerable sums of money were contributed by manufacturers to assist in paying for the passage of immigrants, and several shiploads have been imported.

It has been stated in southern newspapers, that the action of the federal government, in suing manufacturers of North Carolina for breach of the immigration law, was brought about through complaint of New England manufacturers. This seems to me an entirely unwarranted assumption. There are several reasons why such action would be as unlikely, as it would be narrow-minded and foolish. There is a large amount of northern capital invested in southern mills; prosperity in the South helps the general prosperity of the country; and, most important of all, in order to retain this imported skilled labor, it will be necessary to place wages, hours of labor, and educational and social advantages on a plane of equality with those in the northern states. Otherwise, these people will quickly drift to the North, and in doing so would be apt to create discontent among the native help. The importation of this help means, therefore, a speedy equalization of conditions, and when that is accomplished, success will be determined, not by location north or south, but by efficiency of commercial and technical management.

In many mill centres the manufacturer's difficulty lies, not in lack of help, but in its inefficiency. Numerous mills have represented among their employees, ten or more nationalities, and about as many languages. Overseers frequently have to instruct by sign rather than speech. Many of these people

Digitized by Google

have neither inherited talent nor acquired experience in textile work. Trained employees of other nationalities seem to prefer to work for half the pay in stores, and in other branches of industry, which are classed as higher grade than the cotton mill. All this is a serious handicap in producing goods of equal merit to fabrics made abroad, where efficient help can readily be obtained. The immigration law provides "that skilled labor may be imported, if labor of like kind unemployed cannot be found in this country." The present condition would undoubtedly justify cotton manufacturers in importing skilled labor, but the law does not state any practicable method of carrying out the proviso.

In reply to an inquiry as to how cotton manufacturers should proceed who desire to avail themselves of this proviso, and what they must do to demonstrate that skilled unemployed labor cannot be found, and that in consequence they are legally entitled to import skilled labor, the Commissioner-General writes:

"There can be no predetermination as to whether or not skilled labor for any purpose cannot be obtained in the United States, as the decision on that question must necessarily be deferred until arrival of the aliens concerned at a port of entry in this country. It is customary where recourse is to be had to the foreign labor market, for the manufacturers in this country to advertise extensively in the trade and other papers of the United States as a means of determining whether the requisite skilled help may be found here. If the effort proves unsuccessful, evidence as to its having been made may be submitted to the inspection officers at the port of entry when aliens arrive and present themselves for admission to accept pre-arranged employment."

It is a question whether the present law is of real benefit to the labor that it is intended to protect. It may impede the progress of American manufacturing, and encourage the importation of cotton goods, and, at the same time, fill up the mills with immigrants of lower grade.

In bulletin 69 of the Bureau of the Census, entitled Child Labor in the United States, it is stated, "to a greater extent

Digitized by Google

than any other manufacturing or mechanical industry, the cotton mill furnishes employment to children." In view of the existing public sentiment against child labor, it is interesting to analyze the figures of the census of 1900 as they apply to our industry. The total number of children under fourteen years of age employed in cotton mills, is 18,926. Of this number the southern states contribute 16,105, and the northern states, 2,821. The conditions existing abroad should also be considered in connection with this question. Belgium and Italy forbid employment in factories of children under twelve years; in France the standard is thirteen; in Germany, thirteen, with only six hours of work allowed per day, up to fourteen years of age; in Austria and Switzerland, fourteen years; in Britain, the half time system, of working alternate days, or half of each day, prevails from twelve to fourteen. In most countries there is an educational and physical standard required, up to a higher age than stated above.

It is not likely that our country will long tolerate in any of its states a lower standard than prevails in the most enlightened European countries, and I believe that cotton manufacturers heartily approve the fourteen-year limit. Consideration should, however, be given to conditions in the South. It is not to be expected that the southern states can accomplish in a few years, what has taken a century in the older manufacturing states of America and in foreign countries. The modern development of cotton manufacturing in the South has given employment and opportunity in life to thousands, who previously were almost destitute, and southern manufacturers plead for time to work out this problem without crippling industrial progress. The stigma attached to cotton manufacturing through employing so many children under fourteen, should at no distant date be entirely removed, and doubtless it will be. In considering a higher age limit than fourteen, there is much room for debate as to what is for the best welfare of the child, the family, and the industry. Possibly an educational and physical standard is advisable above fourteen. The industrial school system, which has

Digitized by Google

been adopted so extensively in Germany, and is contemplated in Massachusetts, may afford the right kind of advanced education, thereby increasing opportunity, and at the same time providing better trained workers for our factories. I believe that any arbitrary law which would prohibit work in mills to children who had reached the age of fourteen, and had come up to a required physical and educational standard, would be injurious to the best interests of all concerned. Not a few of the most successful members of this Association began work at fourteen, and in some cases much earlier.

There are many forms of labor legislation that are obnoxious and should be stoutly opposed, but I believe that, in justice both to work people and employers, there should be a law to provide fair and proper remuneration to employees who are injured by accident. This system, known as Workmen's Compensation or Employers' Liability, prevails in the leading industrial nations of Europe. In our country the injured workman, or the relatives of the workman who is fatally injured, can only recover damages by action at common law; and even this he cannot do, if the accident is caused by his own or a fellow servant's negligence. He is thus forced to incur heavy expense, or divide his claim with lawyers, many of whom are unprincipled, and are only too glad to get the opportunity to sue and harass business corporations. The manufacturer resorts to insurance to protect himself against claims, and is thus placed in a position where he cannot assist or sympathize with an injured employee, until he can have assurance that no legal action will be taken.

A Workmen's Compensation Act, such as exists in Great Britain, specifies the wages that shall be paid during absence on account of injury, and the amount that shall be paid if death results from an accident. Disputes are settled by a simple form of arbitration. There might be some increased outlay to the manufacturer, but if generally adopted, this would become a fixed charge of the business, and would be added to the cost of production and paid eventually by the consumer. The employee would be justly treated without squandering his money in legal

Digitized by Google

expenses. In Great Britain, the cost of insurance is two-fifths of one per cent., which on a pay-roll of $500,000 would mean an expense of $2,000. The present rate of insurance here is about one-fifth of one per cent. or $1,000 on a similar pay-roll. This covers medical treatment, legal expenses, and the workmen's compensation, which is awarded by the court, but when the judgment exceeds a certain amount, the manufacturer is not fully protected by his insurance policy. This matter is outside of the scope of federal legislation; and it is therefore used as an argument against such a law, that it would be an unfair burden to manufacturers located in the states which first adopted it. Why should not the state, as in Germany, bear part of the expense until it becomes a common charge on production in all important manufacturing states?

In Rhode Island a beneficent work has lately been inaugurated, which aims at enlisting the co-operation of employers of labor, in discovering cases of tuberculosis in their works, and of physicians, in intelligently directing the treatment of such cases. Medical science has demonstrated that people are not foreordained to suffer hopelessly from this disease, but, that, on the contrary, it can be checked and eradicated by observing simple hygienic rules. This movement should be extended to other mill centres. It is doubly valuable, in that it tends to relieve human suffering and to create more sympathetic relations between employer and employees.

In my address a year ago, I called attention to the rewriting of the tariff through decisions of the general appraisers and the courts. This work has been carried on with increasing vigor, and with some measure of success, through the efforts of so-called customs lawyers, who work for fifty per cent. of the duties recovered. The Treasury Department informs me that under the cotton schedule, during the eight and one-half months ending March 15th, 1907, 1,400 protests against the classification of cotton manufactures were filed by importers, compared with 650 for the fiscal year ending June 30th, 1906, and 450 for the previous year. This shows that four times as many protests

Digitized by Google

are being entered now as there were two years ago. At this meeting, an interesting paper will be read by an ex-assistant appraiser, describing the changes that have been brought about in the appraisement of cotton goods in recent years. I am glad to say that this system, so detrimental and unfair both to government revenue and to domestic manufacturing interests, is to be exposed and vigorously combated, through the co-operation of members of this Association.

There are now two large manufacturing Associations with similar purposes and aims. Our own, The National Association, represents more particularly the North, and the American Cotton Manufacturers' Association has a large proportion of its membership in the South. It might be advisable for these two Associations to enter into negotiations aiming at a closer affiliation. If nothing more could be accomplished, their spring meeting might be held biennially in joint session at Washington or Philadelphia, thus affording an opportunity for the interchange of ideas and more united action in matters of importance to the cotton trade.

For this meeting, the Board of Government presents an attractive programme of addresses and papers touching upon commercial and mechanical subjects. Our membership is composed about equally of representatives of these two sides of the industry. Cotton manufacturing in our country is capable of tremendous expansion in the years to come, and there is scope for the exercise of the highest commercial as well as technical ability. The American people will not always be satisfied to grow eighty per cent. of the world's cotton, and spin only twenty-five per cent. of it. Gentlemen, the opportunity is yours.

The PRESIDENT. The relation of corporations to the public welfare is a topic of intense interest at the present time. We are to be favored with an address on that subject by a gentleman who is a prominent corporation lawyer, and a student of economics. I have the pleasure of introducing to you, EVERETT W. BURDETT, Esq., of Boston.

Digitized by Google

Mr. EVERETT W. BURDETT. Mr. President, and such members of the Association as feel sufficient interest to listen: When your Secretary extended the invitation of your Association for me to address you upon this occasion, I informed him that I hadn't anything of special interest to say to cotton manufacturers. He replied that an address of that kind was not expected, but that I was desired to speak upon any economic subject of general interest to you members, as citizens rather than as manufacturers. I have accordingly chosen a topic which I deem of paramount importance at this particular time, corporations and the public welfare, or, more correctly stated public service corporations and the public welfare.

Digitized by Google

CORPORATIONS AND THE PUBLIC WELFARE.

EVERETT W. BURDETT, 84 State St., Boston, Mass.

The predominating characteristics of the times is unrest. At home and abroad dissatisfaction and discontent are rampant in the public mind. In different countries it takes different forms —but everywhere, unrest. The subjects of this discontent are partly political but predominantly social and industrial conditions. There is an increasing antagonism between those who are governed and those who govern them—between the employed and the employer—between the rich and the poor. Notwithstanding the unparalleled prosperity in all kinds of business and among all classes of people in this country, the cry is still for change — sometimes for revolution — in industrial conditions. The corporate enterprises of the country, conspicuously the transportation companies, have recently enjoyed a literal embarrasment of riches never before known, and they have shared it, in a measure—adequate or inadequate, as the case may be—with their employees. Wages have been raised to such an extent that the payrolls of single corporations have been increased by annual additions not of thousands but of millions of dollars; and yet in the case of these very corporations, their employees, with or without just cause, have demanded more pay and shorter hours; so that at least apparent generosity has been met with angry demands for more. I am not undertaking to judge between these contending forces, but only to assert the existence and point out the nature of the conflict.

But the discontent with existing conditions is by no means confined to the case of the employer and employee. Indeed, it

Digitized by Google

is confined to no single class or small group of classes. It has finally permeated the general body politic, and has arrayed the community at large against the great corporate interests of the country. Local corporations of a quasi-public character often fail to meet the demands or conciliate the good will of their local customers. An apparently "irrepressible conflict" exists between the principal, if not most, of the municipal corporations of the United States and the private quasi-public corporations which use their streets and supply indispensable public services.

When we look to the wider field of interstate commerce, we find the same conditions in exaggerated form. The railroads of the country are at open war with the Federal authorities. The struggle, on the one hand, is to check and curb and govern the activities of private capital invested in transportation, and, on the other, to resist and defeat interference, supervision or control of corporate enterprises by governmental agencies. An almost abnormally active and strenuous Chief Executive has practically forced the National Congress to enact and strengthen laws designed to secure such supervision and control, notwithstanding the most obstinate and persistent opposition at every step.

And he is now bent upon still further enlargements of the existing Federal control of the great transportation companies of the country. This, in turn, will not be accomplished, if at all, without overcoming the most strenuous and determined opposition of the great masters of business and "captains of industry" who have heretofore directed the activities and controlled the destinies of these business enterprises without a suggestion of interference from outside their own charmed circle.

What is the outcome to be? Upon the answer to that question depends not only the safety and value of existing investments of private capital, but in a large degree the convenience, the prosperity and the happiness of the great body of our people.

Such a state of things as I have described raises up a host of would-be saviors of the people's interests. The theorist, the doctrinaire, the economist, the statesman, the politician, are

Digitized by Google

all interested in and many of them expounders of the remedies to be applied. Panaceas of all descriptions are suggested. The public mind is burdened with the claims put forward for a great variety of patent medicines, all warranted to cure the ills of the body politic.

But, of all others, the demagogue finds the times most favorable for his activitives. Be he politician, yellow journalist, so-called labor reformer, or charlatan of any kind, he finds the dough ready for his kneading. And he is a member of society who never neglects his opportunity. The merchant may be too busy selling goods, the lawyer in trying causes, the minister in saving souls, and the numerous other active members of society in their several fields of usefulness; but the demagogue always has time and never neglects the opportunity to use his voice or his pen to incite the public mind and fan the flames of popular discontent. Like birds of prey, these men fatten on the misfortunes of others, and hover over their victims till they fall exhausted from the stress of the conflict, which false friends have encouraged and made more bitter and more fatal than it would otherwise have been.

And such as these are not, in modern times, recruited altogether from the ranks of those unfortunates who have been embittered by persecution or have suffered from misfortune. Recent years have developed a new and more dangerous type—the rich man, who, instead of founding beneficent institutions or supporting great enterprises for the uplifting of mankind, has used his means and the talents which can be purchased with them to sow the seeds of strife and discontent. The aim of such men is to create envy, to promote strife, to engender hatred, to make the fortunate discontented and the unfortunate desperate. They substitute accusation for proof, misrepresentation for argument, hysterics for reason. And for what purpose? What, indeed, but the promotion of private ends; the elevation of the individual at the expense of his victims? They are the modern Neros, who can gloat over a burning city if it but furnish them unholy pleasures or rewards.

Digitized by Google

Such charlatans are found not only in politics and in journalism but in the business field as well. Whether by the employment or denouncement of "high finance" — by liberal use of printer's ink in the form of financial advertisements or advice — or by other tricks of the trade of deceiving the uninitiated, these financial vultures succeed in feathering their own nests with the plumage of their victims.

In the case of some of these demagogues it is political advancement which is sought; in that of others, it is wealth and luxury or industrial or financial power.

Unfortunately, the people listen to these charlatans. It is probably still true, as our great LINCOLN said, that "you cannot fool all the people all the time;" but it is unfortunately true now, as it always has been, that the populace is subject to sudden gusts of passion and can be temporarily misled by false prophets. So far, they have never done any permanent harm. But our anxiety is lest the next wave of popular discontent and fanaticism does not engulf us before its force is broken and its course turned back.

The particular object of the present popular distrust and antagonism is, as already indicated, the corporation. The very word "corporation" has come to have an opprobrium of its own. Forgetful or regardless of what the corporation has done for the country and for its development and prosperity, the people rage against it as an unclean thing. They say that it has been made the tool of designing men, who have abused corporate powers to oppress the people; that it has assumed the arrogance of the master, instead of discharging its duties as a servant of the public; that it has been employed to fatten the purses of those who own or control it, by robbing the people of the means to do so; that it has corrupted politics, and controlled officials; that legislatures have done its bidding, and even the courts have not always treated it with even-handed justice; that the primary object of its creation and the justification for its existence, to wit, its service to the state and its inhabitants, have been subverted to the private gain of individuals.

Digitized by Google

This, surely, is a severe indictment, and if justified, in whole or in part, calls loudly for a remedy.

It would be an easy and agreeable task to put the other side; to show the inestimable value which corporate enterprise has been to the country and all its people — how it has built our mills; projected our railroads; given profitable employment for the savings of the poor as well as the capital of the rich; furnished the incentive to inventive talent and a field of operations to the natural leaders of men and founders of enterprises; how it has promoted individual initiative and rewarded personal endeavor, how it has given work to millions of workmen and sent the products of their skill and labor into the remotest corners of the world; in short, how it has promoted the chief end of man by preserving and fostering what the fathers of our government called his "inalienable right" to "the pursuit of happiness." Moreover, how the great individual fortunes accumulated in corporate enterprises have been, (and never more than now,) devoted to the amelioration of the misfortunes and the advancement of the education and happiness of mankind, by the founding and maintenance of innumerable hospitals, libraries, colleges, art galleries, medical and technical schools, life-saving stations, pensions, rewards for courage and humanity, funds for scientific investigation and for the advancement of good causes too numerous to mention. Figures, ranging into millions and hundreds of millions, might be piled on figures, like Pelion on Ossa, to substantiate this claim; and if marshalled, none so callous or dissatisfied but would be astounded and gladdened by the wonderful showing for humanity which they would make. But just now they are apparently forgotten. The fact is ignored that without corporate development of the industries of the country, particularly the transportation and banking facilities which are vital to our progress and prosperity, no such showing could be made as that the value of our manufactured products have increased more than 300 per cent. in the last 25 years, and over 30 per cent. in the last 6 years, resulting in the prosperity not only of those engaged in business on their own

Digitized by Google

account, but of those dependent upon wages. That the latter have had their full share of the marvelous prosperity of the country is attested by the fact that the number of depositors in savings banks has increased 229 per cent. in the last 25 years, and the amount of their deposits 279 per cent. Such deposits now aggregate considerably more than three thousand million dollars. So enormous is the amount of work to be done and of the riches to be gathered, that the cry is still for men to do the work. With an average population of only 26 to the square mile in the United States, as against about 187 in France and more than 300 in Great Britain, the million immigrants who annually land upon our shores are wholly inadequate to meet the demand for labor. No legitimate "army of the unemployed" exists in this country, and none seems likely in the near future.

When the public-service corporation first made its appearance in the American industrial world it was a feeble infant. The first steam railroads were short lines of only local consequence. The Baltimore and Ohio Railroad was chartered in 1829 and was first operated, in part by horses, in 1830. The Boston and Lowell Railroad in this state was chartered in the same year, and the Boston and Providence and Boston and Worcester in the following year. At the close of 1830 the total railroad mileage in the United States was only 23. At the close of 1906, it was estimated at 313,000. The consideration for their charters, as afterward judicially expressed, was the acceptance of the grant and the operation of the road for the benefit of the public thereunder.

But that the protection of the public against abuse of these new forms of public convenience was not thought necessary at the time, appears from the fact that in each of the Massachusetts railroad charters already mentioned the rates of fare and freight, the construction of the roads, the form of cars, "and all other matters and things in relation to the use" of the roads were left wholly to the discretion of the directors.

The first telegraph line in this country, that between Wash-

Digitized by Google

ington and Baltimore, was built in 1844, and was the pioneer line of the world. The telegraph mileage of the United States is now estimated at more than a million and a half.

The first trans-Atlantic cable was successfully laid in 1858, but it shortly broke, and was not finally laid successfully till 1866. Now there are more than 260,000 miles of submarine cables in the world, excluding those in lakes and interior water-courses.*

The telephone, as a commercial instrument, made its first appearance in 1876. Today it is estimated that there are in use in the United States more than 10,000,000 instruments.

The first street car in the United States is said to have been operated in New York in 1852. The first cars were operated in Massachusetts in 1856. The first successful application of electric traction in this Commonwealth was in 1888. The Boston system was so equipped in 1889. There are now upwards of 23,000 miles of electric railway in the United States.

Electricity was not commercially employed for the production of light and power till 1876, and the industry has not yet wholly emerged from its experimental period, though there are in the United States nearly 5,000 central station electric lighting plants, representing an investment of $700,000,000, and involving a yearly operating expense of nearly or quite $100,000,000.†

Thus it is seen that notwithstanding their present importance, most of these great agencies for the promotion of public convenience are of recent origin. The beginnings of the oldest of them are within the recollection of men now living, while the more recent have been commercially developed within the life time of those who have but just reached manhood. Old men can recall the origin of railroads; men of middle age, that of the telegraph and the cable; young men, that of electric traction, light and power, and the transmission of human speech by electricity.

---

*Private lines, 195,808 nautical miles; government lines, 37,538 nautical miles. (World's Almanac, 1907.)

†Report Committee on Progress, National Electric Light Association, 1906.

Digitized by Google

All of these agencies for the promotion of public convenience were so welcome when they came, and have been in commercial use for so short a time, that not until a comparatively recent date have the abuses which have accompanied their development attracted general public attention.

They were started for legitimate and sufficient reasons — the necessity of getting together capital in excess of that which could be furnished by private persons, and the security of the investor in experimental undertakings against personal liability. In the early days the promoter and capitalist of the modern types were unknown. The art of suddenly amassing great private fortunes through the manipulation of the first issues of corporate securities had not then been discovered. The putting out of more stocks and bonds than were reasonably necessary for construction and equipment had not occurred to those who inaugurated the new enterprises

But when these undertakings proved to be successful, and commercial conditions called for their multiplication and enlargement, the banker and the contractor were not slow in learning the financial possibilities which they created, or in grasping the opportunities which they offered.

Nobody can safely be trusted with absolute power. "The King can do no wrong" is a doctrine as false in finance as in politics. Irresponsibility breeds contempt of restraint, and inevitably leads to infringements of the rights of others. The culmination of the opportunites furnished by such a condition is naturally such as has been exhibited in the recent insurance and railroad investigations. Men in the control of millions of other peoples' money, unrestrained by either public authority or adequate private oversight or accountability, naturally fall into the habit of treating and almost considering the millions which they control their own. We have, therefore, within the twelvemonth, seen men drunk with financial power driven in disgrace from high places in the insurance world; and, within the present year, have seen exhibitions of financial arrogance and double-dealing in the realm of "high finance" as applied to railroads

Digitized by Google

which have aroused the indignation and disgust of stockholders and the general public alike.

It is such exhibitions as these which make the subject of our present discussion of paramount interest and importance. The public control of public-service corporations, in some form, is now a certainty. The question is, what shall it be?

Heretofore the principal efforts have been towards regulation of rates. Ruthlessly reduced by statutes, these rates have become the subject of most important judgments by the Supreme Court of the United States, which has thrown over the transportation companies the protection of the federal Constitution, guaranteeing all our citizens, including corporations, against spoilation under the forms of law. It has thus been settled, not only that one's property cannot be taken from him without just compensation and due process of law, but that the deprivation by law of the profitable use of it is equally a violation of the rights of property.

But even these decisions have not provided a complete remedy for existing evils. While the court can, and frequently has, set aside local statutes or orders imposing unreasonable rates, it has no power to substitute any other rate therefor, and has not yet announced any definite rule as to what is reasonable compensation, or fixed with any certainty the basis upon which such compensation is to be calculated.

This hiatus, so to speak, in the decisions of the court, led the President at the last session of Congress, to insist upon a law giving the Interstate Commerce Commission authority to fix rates, subject to review by judicial tribunals. The Commission had previously assumed and exercised this right, but, as the Supreme Court decided in 1896, without competent authority.

The President now insists upon going further. He announces the proposition that the power to fix rates is of little consequence—indeed, may be the instrument of great injustice alike to the carriers and the public—without the ability to determine the fair value of the investment upon which, in part, the rates are based, and the power to limit the amount of the securities representing that investment.

Digitized by Google

He therefore proposes, as I understand his program, though it has not been officially announced, some more certain and effective method of determining the values of the present investments in transportation properties, and a federal supervision and control of the amount of future securities to be issued against them. I do not understand that his program involves any interference with securities heretofore issued and now outstanding.

The pending question is, whether this proposed extension of federal supervision and control over private enterprise and capital is going too far, and should be checked in the interests of both the corporations and the public; or whether, on the other hand, it is a step in advance which would promote the interests of one or both. Perhaps the solution of the problem can be promoted by an answer to the further question, what may be expected if the President's program, in some form, is not carried out? That question, in my judgment, involves very serious consequences, and I shall undertake to answer it in the light of those consequences.

Fortunately it is a question which may be discussed without reference to the ordinary divisions of political sentiment. Republicans and Democrats may readily agree upon solutions of these problems and still remain as far apart as the poles on other questions of public policy.

So far as I know, the first attempts at public control of private corporate enterprises through valuations of the necessary investments and limitation of the interest and dividend-bearing securities issued against them, were made in Massachusetts. Efforts in other jurisdictions had been largely, if not entirely, confined to drastic control and regulation of rates, — a process necessarily attended with more or less brutal, because ignorant, exercises of official power. But these rates have, when judicially tested, been almost always set aside; and even the decisions of the Interstate Commerce Commission have been reversed in about nine cases out of every ten.*

* (David Willcox, Pres. Del. & Hud. Ry.)

Digitized by Google

So far as public-service corporations other than steam railroads are concerned, they have in but rare instances, so far as I know, been made the subject of state regulation or control through special tribunals created for the purpose, but have been left at the mercy of state legislatures, or, worse yet, of the various municipal authorities where they operate. This policy, or, rather, lack of policy, has forced these corporations more or less into state and local politics, — a course justified, if at all, by the dictates of "the first law of nature" — that of self-defence.

But in 1894 Massachusetts entered upon a more enlightened experiment in public regulation and control of private enterprises of a quasi-public character. It adopted the plan of absolutely controlling the issue of future securities against the properties of such corporations, whether in the form of stocks, bonds, notes or other evidences of indebtedness. While it did not and could not undertake to reduce the amount of such securities already outstanding, it gave to public boards of a more or less judicial character effective control over the returns which might be realized upon them. That this control, though drastic in form, has not operated unduly to depreciate the value of property or minimize legitimate returns upon it, appears from the fact that for the nearly thirteen years since it was instituted there have not been, so far as I know, a half-dozen cases where those concerned have felt themselves obliged to invoke the guarantees of the Constitution in the federal courts. In fact, I recall but two such cases.

Since 1894 further statutes have been enacted, authorizing the supervisory boards to impose conditions in connection with new issues of securities calculated to repair out of earnings or otherwise impairments in capital already outstanding in excess of reasonable property valuations.

To prevent the defeat of the purpose of the laws of 1894 by the formation of foreign holding corporations, it was further enacted that if any foreign corporation holding or controlling a majority of the capital stock of a Massachusetts street railway, gas or electric lighting company issues any stocks, bonds or

Digitized by Google

other evidences of indebtedness based upon or secured by the property, franchise or stock of such domestic corporation, unless so authorized by the laws of Massachusetts, the charter of the domestic corporation is liable to forfeiture.*

This act, though brief in terms, has proved to be entirely effective, and the utmost ingenuity of counsel and investors has not succeeded in inventing any successful evasion of it.

There was at first no adequate provision for a judicial review of the action of the commissioners under the statutes of 1894; but since then a statute has been enacted which furnishes an opportunity to correct mistakes of law made by the public boards.†

What has been the result of these enactments — popularly known as the Massachusetts anti-stock-watering laws of 1894? Have they operated to oppress and harass and hinder the corporations, or otherwise? They have had ample time to demonstrate their utility or their banefulness.

In the first place they are not perfect — no human institutions are. They have not always been wisely and justly administered, but they have never been consciously used as instruments of oppression, and have never been availed of for purposes of "graft." Though the low salaries paid the commissioners have not been adequate in all instances to secure the services of the strongest men, they have been sufficient to attract the services of honest men of good intentions, who have been equally anxious to promote the public good and conserve what they have regarded as the true interests of the corporations. Mistakes have been made — narrowness of view has sometimes characterized official action; but, upon the whole, I think those concerned with corporate as well as those concerned with public interests will be found to be in practical agreement that the laws referred to and their administration have been fairly satisfactory, and that no considerable force could now be mustered from any quarter to repeal them.

But it must always be borne in mind that these commissioners

* Rev. Laws, chap. 126, § 11.

† Rev. Laws, chap. 112, § 100.

Digitized by Google

are state officials, appointed by the governor, and engaged in the discharge of duties of a public nature. They are therefore in a position to take a broader view, and follow out more independent lines of action, than would otherwise be the case.

In addition to the extensive powers enjoyed by these boards under the anti-stock-watering acts of 1894, they have very ample authority as to the regulation of rates, requirements of service and the like, under other statutes.

Nearly contemporaneously with the Acts of 1894, the legislature of Massachusetts enacted a municipal ownership law. The act was passed in 1891, and received important amendments in 1893. It authorized any city or town to establish a municipal electric plant, for the furnishing of light or power to itself and its inhabitants, upon condition of its purchase of any existing plant within its limits at its fair market value for the purposes of its use, excluding franchise and good will values.

Massachusetts has therefore furnished its citizens for the last dozen years or so a fair opportunity to test the relative merits of public control of private corporations and municipal ownership of public-utility services. The judgment of the public upon the relative merits of the two is, perhaps, in a measure shown by the fact that out of the 365 towns and cities of Massachusetts only a little more than 20 have availed themselves of the right to established municipal electric works, while there have been very many instances in which the regulating machinery of the state has been put into successful operation for the regulation of rates, the requirements of supply, and so forth.

The one principal defect in the Massachusetts stock and bond limitation laws and their administration lies, in my mind, in the failure to discriminate between the conditions surrounding the promotion of new enterprises and those attaching to well-established industries. As to the latter, no conclusive objection can, I think, be stated to the policy of limiting the issue of their new securities to amounts sufficient only to cover the reasonable expense of additions to plant and the returns upon them to the going rates of interest or profit legitimate in established

Digitized by Google

enterprises of like character. But the pioneer assumes unusual risks and is entitled to more than usual profits, if he can succeed in getting any. But right here the Massachusetts laws fail to make a legitimate discrimination. New enterprises are dealt with, with the same strictness as old ones. The pioneer, the promotor, the bold man who first dares to enter into and explore a new and hitherto unexploited field, is treated practically the same as the conservative, over-cautious investor.

President ELIOT in a thoughtful address, * has recently said:

"There is much to be said on behalf of the proposition that there should be no water in the stock of public-service corporations; yet if this principle had been applied to all street railway and lighting companies during the past thirty-five years, the public would have waited long for facilities which they have greatly enjoyed and profited by. In such enterprises there are often heavy risks. . . . Hence men will not undertake them for the ordinary return on safe investments. They must be induced to venture their capital and their capacity by a prospect of unusual returns."

And he adds that it is in the interest of all classes in the community that the pioneer in a new field of industry should be allowed unusual returns if he can get them.

The great authority of the Supreme Court of the United States stands for the proposition that, even in the case of an established enterprise, a corporation finding itself in financial straits, may legitimately, in the absence of statute, in order to recuperate itself and put its business on a sounder basis, issue additional capital stock at such price as can be obtained for it, even if less than par. So long as the transaction is *bona fide*, and not a mere cover for watering the stock, and the price obtained represents the actual value of the stock, the courts have no disposition to disturb it.† And there is much, though I think not conclusive, force in the claim which is now made, that no new legislation should impair the opportunity of exist-

* "The Ethics of Corporate Management," Chicago, March 10, 1906.

† HANDLEY v. STUTZ, 139 U. S. 417, and cases cited.

Digitized by Google

ing corporations to do the same thing under similar circumstances.

I point out this primal defect in the laws of Massachusetts and their administration to indicate what should be avoided in similar laws when passed, as I believe they soon will be, by various other States of the Union and perhaps by the Federal government itself. There are at this time many bills looking to public control of corporations and their capitalization pending in different states, notably, the so-called Public Utility bill in the state of New York. The subject is, therefore, a live one, and it is of great importance that the prospective new legislation shall appropriate what is good and eliminate what is unsound in the Massachusetts system.

In dealing with the general subject, the choice lies between some form of public regulation and control, on the one hand, and some form of public ownership, on the other. The people and their representatives are finally and fully alive to the abuses which exist. They may exaggerate them, but they will not much longer tolerate them. The question is, whether they shall be opposed in all reasonable endeavors, and thus made radical and vindictive; or whether they shall be met by the corporations in a spirit of conciliation, which will, in turn, win fair treatment for those whose interest are involved.

The leader of one of the great political parties of the country, twice its chosen standard bearer in national elections, has recently declared in a letter to a distinguished citizen of Massachusetts* that he believes that "public ownership is the ultimate solution of the railroad question," although he suggests a doubt whether the people are yet ready to consider public ownership seriously. It is this hesitation on the part of the conservative classes of our citizens which constitutes our present security against public ownership; but if radical reforms are not effected in private management of public-service properties, the people will turn to public ownership as a choice of evils. The corporations have come to the parting of the ways; they must take the

* WILLIAM J. BRYAN to HENRY M. WHITNEY, March 25, 1907.

Digitized by Google

road to public regulation and control, and thus to safety; or they must prepare to meet the deluge.

Fortunately, the game is largely in their own hands, if they know how to play it. Particularly at the South, public sentiment is very strong against further centralization of power at Washington, while the natural instincts of the more conservative citizens of the East is against a transfer of industrial enterprises from private hands to public authorities. Fortunately, a President who has an unprecedented hold upon the affections and loyalty of the masses of our people is inflexibly opposed to public ownership, if proper public control can be secured. He has said, "I do not believe in government ownership of anything which can with propriety be left in private hands." But in the same connection he asserted the absolute necessity of governmental regulation and control.

Human nature cannot safely be trusted to regenerate itself. Many of the practical managers of great corporate enterprises have come to see that their ultimate prosperity does not lie along the line of unrestricted license,—that more intimate relations with the public, through the public authorities, though not wholly palatable, will ultimately prove to be more profitable. Indeed, the hope may reasonably be indulged that practically all such managers are amendable to reason, and can be brought to see the financial wisdom of a change of attitude.

But the trouble is higher up. It is the bankers and great capitalists, the so-called "money kings," who dictate to the practical managers of the properties, who are hopeless. It is they who ruthlessly dismiss recalcitrant officials; who insist upon high rates to produce dividends on inflated capitals; who favor discriminations for their friends and against their enemies; who, in short, harbor the sentiment, if they are too wise publicly to express it, "the public be damned." They are the men who make the trouble, and they are the men who must take the medicine. The question is, what shall the remedy be? What kind of reform will the public insist upon?

As I have said, it will be either public control or public

Digitized by Google

ownership. The latter, while it will remove the evils now complained of, will lead to others of almost as serious a character, and perhaps still others we know not of.

ISADOR RAYNOR, the distinguished senator from Maryland, who has devoted his great talents for years to a study of the problem, has recently said * that government ownership of railroads has been a practical failure in Germany, Austria, Hungary, Russia and Australia. Indeed, he pronounces them "an utter failure," and says that "they do not compare either in point of facilities or low rates or in any other way with the American system of private ownership." VON MIGUEL, Prussia's great finance minister from 1890 to 1900, openly declared that governmental ownership was a disaster and a calamity.

Turning to those great modern utilities of the first class which employ electricity, it will be found that public ownership has never produced results at all comparable with those attained under private management. Human nature is so constituted that no substitute has been found in the industrial field for individual energy, inspired by the hope of personal reward. Officialdom does not and cannot match private enterprise in either the initiation, development or prosecution of essentially business undertakings.

The experiment of encouraging municipal activity and discouraging private enterprise has been tried extensively in Great Britain and with discouraging results. Ever since the passage of the Tramways Act of 1870, the Electric Lighting Acts of 1882 and 1888, and the Light Railways Act of 1896, it has been easy for public bodies and discouragingly difficult for private capital to exploit and prosecute the businesses to which these acts relate;† and yet when private enterprise has been given anything like equal opportunities, it has beaten public undertakings of like character in a remarkable degree.

Whatever else may be said for or against public ownership and operation of electrical enterprises in Great Britain, it has

* Baltimore Sun.

† See article by E. W. BURDETT in Journal of Political Economy for May, 1906.

Digitized by Google

certainly resulted in a most serious and uneconomic restriction of the development of the industry as a whole.

Municipal incursions into fields of private enterprise have been most extensively indulged in by the metropolitan district of London, with consequent enormous additions to municipal indebtedness and ever-increasing rates of local taxation. After years of expensive experiment along these lines, London has recently repudiated them. In the triennial election for members of the London County Council held on March 2, 1907, a "Progressive" majority of 49 was turned into a minority of 40, and the greatest city of the British Empire has decisively set its face against the further extension of municipal ownership and operation of essentially private industries. The London Times, commenting on the election, said that it showed "a sweeping revulsion of popular favor to the side of reform".

That this change of program has been deliberately and decisively made appears from the fact that over 500,000 votes were cast against a continuance of the existing policy, as against about 315,000 votes to sustain it.

It goes without saying that nothing has developed in the United States to lead us for a moment to believe that our American municipalities have or can accomplish better results along these lines than have been obtained by our British brethren.

We therefore shall not find a panacea for existing abuses in public ownership. But we may have to try its efficacy, if the only other remedy suggested is not employed, *to wit:* public regulation and control.

In closing, let me suggest in outline what that regulation and control should be, and should not be.

My general views upon that subject have already been pretty plainly indicated. I shall not at this last moment undertake to elaborate them. Broadly stated, they are as follows:

That state regulations should be inaugurated in all the commonwealths of the Union, the nature and extent of it varying more or less according to local conditions; and that the existing

Digitized by Google

federal regulation and control of interstate railroads should be extended.

State legislation upon this subject should follow the general scheme of the Massachusetts statutes, adopting those portions of them which experience has demonstrated to be wise and wholesome, and rejecting the rest. The principal thing, in my judgment, to be avoided is the mistake of holding the pioneer in a new and untried field to the same rules, particularly of capitalization, as are appled to established enterprises. Just how this distinction is to be made, it is difficult to suggest; but that it can be worked out, both theoretically and empirically, I cannot doubt.

The whole subject calls for the most disinterested public service on the part of our legislators, and for the most careful study and elucidation on the part of all who can be influential in solving the great questions involved. Members of bodies like this should turn their serious attention to the study of this subject, and, with all other good citizens, should lend their influence and their aid to its just and wise solution. We do not live to ourselves alone. We are the citizens of a great country. The future destiny of that country, and the future welfare and happiness of its citizens, depend largely upon the disinterested and patriotic devotion of the business and professional men of the present to the study of the public questions which now confront them and demand solution.

In my opinion, they should, without reference to their general politics, uphold the hands of the President in all wholesome measures for the further regulation of the railroads of the country which he may suggest. As radical as he is, he is, after all, the Great Conservative, because his activity along these lines will be the means of delivering us from the unpatriotic and ruinous radicalism of the irresponsible agitators,—from the machinations of the demagogue and the yellow journal. We may well differ with him as to details. This or that measure proposed by him may be deemed wise or unwise. Every suggestion should be subjected to the test of discussion and inde-

Digitized by Google

pendent thinking. It is no more true in this connection than in any other that "the King can do no wrong." But the President's general purposes should be approved, and his specific recommendations should be viewed in a friendly rather than a hostile spirit. Something must assuredly be done. Everybody cannot have his particular views adopted. But there should be a general spirit of co-operation, to the end that some wise solution of existing difficulties may be found. The doctrine of *laissez faire* cannot be tolerated in this instance. There must be affirmative action taken, and real reforms inaugurated.

If, as I believe he will, the President recognizes the practical impossibility and essential unfairness of any attempt to interfere with the existence or integrity of securities already outstanding, permitting time and the growth of the country to supply, as they surely will, any lack of value which may now attach to them; and confines himself to measures calculated to prevent further unreasonable inflations of corporate securities and to secure more intelligent as well as effective regulation of rates within just limits, and to such other measures as may be fairly incident thereto, we should bid him Godspeed; and should thank Heaven that these necessary reforms, which a righteously indignant people emphatically demand, are in the keeping of a patriot and a thinker, rather than at the tender mercies of self-seeking charlatans.

The PRESIDENT. "The cost of maintenance and depreciation of cotton mills." This subject has been discussed on previous occasions, and is of importance to us. You are to be favored by an address by a gentleman who is a graduate of this institute, and is also by profession an accountant, in close touch with this subject, HARVEY STUART CHASE, Esq., of Boston.

Digitized by Google

THE COST OF MAINTENANCE AND DEPRECIATION OF COTTON MILLS.

HARVEY STUART CHASE, 27 State St., Boston, Mass.

The standpoint of the writer of this paper is that of an impartial observer, who has had experience as an expert accountant in the examination and analysis of cotton mill and other accounts, and who has also had earlier practical experience for some years inside the mill as an operative, working in various departments, from opening room to weaving and finishing.

In cotton mill accounting, as in practically all accounting which has to do with manufacturing processes, the division of the bookkeeping most difficult to handle successfully is that pertaining to "maintenance." This term being used in its broadest sense as covering all costs of wear and tear of plant, including buildings, machinery, tools, etc. *Maintenance*, rightfully used in this broad sense, includes repairs, renewals, reconstruction, deterioration (or "deferred maintenance") and obsolesence.

We will, in this paper, view it under three primary aspects. 1.—Current repairs, meaning wear and tear which is constantly recurring year by year, including both labor and materials whose cost should be borne by each year separately. 2.—Reconstruction, or renewals of portions of the plant which have deteriorated for some years and must now be renewed. This class of maintenance makes good for a series of years and its cost should be spread over such years. 3.—Obsolesence, which is a true element of depreciation, due to changes in methods of manufacture, or improvements in machinery which render por-

Digitized by Google

tions of the plant obsolete even though they may be in excellent physical condition.

In cotton mills, as in most manufacturing enterprises, the first mentioned class, current repairs, is generally well taken care of in the bookkeeping, and properly charged against earnings. The second and third classes, however, are very unsatisfactorily handled in the great majority of mill accounts with which I am acquainted. It is this fact which I desire to comment on at some length in this paper to the end, if possible, of bringing forcibly to the attention of mill treasurers and directors the necessity, which is now more evident than ever before, for better provision in mill accounts for these most important matters; deferred maintenance and depreciation.

A discussion of these subjects must necessarily touch upon a number of disputed points in the management of mill finances including the common practices of cutting down asset values of plant and wiping out portions of the values of stocks-on-hand. These practices are frequently carried to excess by mill treasurers, as is well known, with the result that the annual or semi-annual balance sheet of assets and liabilities becomes scarcely other than a farce. At best it is practically an enigma which can be translated only by knowledge of secret allowances and hidden percentages which are frequently unknown even to the directors.

It is evident that such methods of bookkeeping are not *accounting* methods. They do not *account* for the actual transactions and conditions. They merely serve as a veil to hide the real situation, which may be better or worse than the book showing.

When the actual condition is worse than the book statements, all men of whatever views unite in discountenancing such methods, but when the actual condition is better than the book showing, many men will endorse such bookkeeping as "conservative" or "safe." So long as such allowances are truly conservative and safe ones and the practice does not reach the point where the books become misleading, we may all properly

Digitized by Google

agree with such a standpoint. When, however, conservatism runs to such lengths that the real result of the business of a period is so hocus-pocussed with per cent. reductions, hidden allowances and secret reserves that the directors themselves cannot tell whether the profits shown have been earned in that period, brought forward from some prior period or carried forward to some future period, then it is certainly time for the auditor, in the interest of the stockholders, to object strenuously.

If we are willing to acknowledge that such conditions exist in some of our manufacturing establishments, we must similarly acknowledge that under such conditions, all hope of obtaining true information upon which the directors and stockholders may intelligently act, is wholly lost. Administrative control over such a mill is no longer possible by those outside the scheme of secret reserves. No accurate comparisons of the results of administration in one year or period can be made with other periods under these conditions and the directors as well as the stockholders are placed wholly at the mercy of the executive officer who manipulates the hidden reserves. If we grant such a picture to be a true one, should we not all unite in condemning these practices? I desire to ask wherein this picture is untrue so far as a very considerable number of mills is concerned? The question then arises: have such conditions been seriously condemned by auditors or others? Apparently not. If we ask "why is this?" we will be quoted two answers: first, the "safe and conservative" plea and, second, "taxation."

In the light of what has already been said the first plea must fall to the ground. It is neither safe nor conservative to accept methods of accounting which give the lie to the facts and which render intelligent judgment by the directors and stockholders as to the efficiency or inefficiency of the management wholly fallacious. In what respect,if any, then, is this plea a proper one? Evidently only in relation to questions of maintenance and depreciation. Only to the claim that unknown problems and unforeseen contingencies will arise in the future, which long experience has impressed so forcibly upon the minds of mill

Digitized by Google

managers and directors. We will consider this aspect of the plea more fully a little later and meanwhile we can study the second answer "taxation."

We acknowledge that a mill may, and frequently does avoid taxation to a considerable degree by cutting down the book values of its assets and by concealing the true amount of its invested capital. The equities of tax laws cannot be considered in a brief paper such as this one and therefore we must leave this answer, turned in Yankee fashion into a question, for the practical sense plus conscience of the mill man to solve.

To return now to our present themes, maintenance and depreciation, and the parts they play in whatever justification there may be for secret reserves and partly stated assets. All mill experience, failures and successes alike, go to show that there must be ample reserves. The only question then is this: — shall reserves be secret, or shall they be openly entered as actual accounts in the books?

I desire in this paper to enter a strong plea for the latter course and to point out the advantages of such a course. The present time is especially well fitted for an impartial consideration of such subjects for the reason that other lines of manufacture, particularly machine shops, electric plants, railroad and railway enterprises, public service companies and municipal industries alike are up against these problems of depreciation in a way never before fully realized. In many of these enterprises a correct solution of these problems is a life or death matter. I contend that the cotton industry in New England and elsewhere is confronted by the same spectre and that it behooves mill managers and mill accountants generally, to get exceedingly busy and come to definite and sound conclusions in regard to these questions before the time elapses when such conclusions can be successfully acted upon.

Now, what does all this mean? What must mill managers and accountants consider? Can they avert insolvency or increase profits by mere bookkeeping? It should be unnecessary to state that no such results can be directly expected.

Digitized by Google

Indirectly, however, correct accounting leads to exactly such conclusions. It accomplishes this by putting before the managers the actual results of the business for the period and the true financial conditions at the end of the period. What, then, would an impartial outside observer advise? Would he not advise a persistent attempt to consciously provide for deferred maintenance and depreciation by the formation of reserves correctly set forth in the books and based upon experience of many previous years. Would he not urge that careful estimates be made periodically, covering these doubtful elements and unknown contingencies and that such amounts be charged to expense pro rata over the months of the period and at the same time credited to one or more depreciation (or deferred maintenance) reserves which will stand upon the books as liability accounts; true *reserves* as the name implies. Thereafter all actual expenditures for reconstruction and renewals, other than current repairs, will be charged against these reserve accounts, whose balances at the end of the period will be carried forward to the new period.

With such reserves carefully calculated and in regular use, all assets can be and should be set up at their true values, viz.: — cost less depreciation, or plus appreciation, and a balance sheet thereby provided from which the true financial condition of the enterprise, could be readily determined.

The tendency today in the best managed competitive businesses is to strive to make the accounts keep close to the facts, but the facts which are most elusive and most difficult to establish are acknowledged to be these very elements of maintenance and depreciation. Other operating costs are easily determined. General expenses are equally definite. Interest, taxes, insurance, etc., are positive, but deferred maintenance or deterioration, which is all the time going on, but only now and then actually evident, is a perplexing problem. The only way to conquer it is to get after it in earnest, not to neglect it, or refuse to recognize it, or to smother it under wholesale allowances and secret reserves which bring in more serious problems than those

Digitized by Google

they are supposed to provide for. Some time ago these questions took firm hold of the writer and since that time he has been endeavoring to gather information in regard to fair and regular percentage allowances for the various elements of depreciation, which he hopes to present in practical form at some future meeting of this Association.

The PRESIDENT. This paper will be a valuable one to be studied carefully when published in the Transactions, and also in the textile journals where it will undoubtedly appear.

We shall now proceed to take up the last paper on the programme for the morning session, Taxation and Valuation by HENRY K. ROWELL, ESQ., of Boston.

Mr. HENRY K. ROWELL. Gentlemen of the National Association of Cotton Manufacturers: There is nothing new under the sun, it is said, and this paper that I am to read to you I do not claim to be in any form original, and it is for this reason that I think the strength of the paper lies — that it is not original. The purpose of this paper is to discuss briefly the subject of taxation and valuation as affecting industrial enterprises.

Digitized by Google

TAXATION AND VALUATION.

HENRY K. ROWELL, 45 Milk Street, Boston, Mass.

Introduction.

The purpose of this paper is to discuss briefly, the subject of taxation and valuation as affecting industrial enterprises.

The subject is divided into three general topics, as follows:—

Part I.

In which the principles of the common law relating to taxation are set forth, as determined by rulings handed down in the decisions from the United States Supreme Court, and the highest appellate courts of the several states.

The terms "uniform and equal" and the meaning of the word "value" as found in the Constitution, is taken into consideration as well as the elements of property subject to a tax.

Part II.

In which the method of determining values is discussed, and how the property to be valued is to be considered where it is used in connection with other property.

Part III.

In which the Law of Evidence is considered and what may be admitted as evidence to establish the values of property from its capacity for valuable use.

Digitized by Google

General Summary.

In which the chief points brought out in the discussion are briefly stated.

Part I.

THE LAW OF TAXATION.

It was said by the Supreme Court of the United States, in a recent opinion, that it is only of late years, when the burdens of taxation are increasing by reason of the great expanses of the government, that the objects and modes of taxation have become a matter of special scrutiny.

In this case the court held unconstitutional a Federal tax which had been exercised without question at different periods for over a hundred years, since the foundation of the government, and said that the delay in presenting such questions was no excuse for not giving them full consideration and determining them in accordance with the true meaning of the Constitution. Fairbanks vs. U. S. 181 U. S. 312.

The Constitution of the United States says, in Article 1, Section 8: "The Congress shall have power to lay and collect taxes, duties, imposts, and excises; to pay debts and provide for the common defence and general welfare of the United States: but all duties, imposts and excises shall be uniform throughout the United States."

The 14th Amendment, Sec. 1, says that no state shall make or enforce any law which shall abridge the privilege or immunities of citizens of the United States: nor shall any state deprive any person of life, liberty, or property without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws.

As we come to examine the constitutional provisions for taxation of the several states, we find they all assert that the taxes shall be uniform and equal, in some form of expression. Some states say uniform upon the same class of subjects; some states say a uniform and equal rate of assessment; some states

Digitized by Google

say uniform, and that all taxes shall be levied and collected by general laws; some states say equal and uniform, and that all property shall be taxed in proportion to its value; some states say that all property shall have a cash valuation and be equalized and uniform throughout the state; some states say that the equal rate of assessments shall be provided as shall secure a just valuation of all property; that property shall be assessed at its fair market value; that property shall be assessed at its true cash value. The Constitution of Nebraska says that the value shall be ascertained in such manner as the legislature shall direct. The Revised Laws of Massachusetts, Ch. 12, Sec. 51, says: "The assessors of each city and town shall, at the time appointed therefor, make a fair cash valuation of all the estate both real and personal; subject to taxation therein."

In reading through the various constitutional provisions relating to taxes and assessments, we are impressed by the almost universal use of the expression "uniform and equal" as well as the qualification of the word "value." So much are we impressed by these expressions, that our curiosity leads us to investigate their meanings, and the manner in which the courts have interpreted their meanings.

UNIFORM AND EQUAL.

The Constitution of the United States provides that all duties, imposts, and excises shall be uniform throughout the United States. It is held that the uniformity thus required, is geographical only, that is, the tax must operate equally throughout the United States. Intrinsic uniformity of operation upon all persons similarly situated under the construction given to the requirements of equality and uniformity in state constitutions, is not required in this limitation upon Federal taxation.

In the case of KNOWLTON vs. MOORE, 178 U. S. 41–78, it was strongly argued that the inheritance taxation in question was lacking in intrinsic uniformity because it exempted legacies and distributive shares in personal property below ten thousand dollars, classified the rate of tax according to the relationship

Digitized by Google

or absence of relationship to the descendant of the legatee, or distributee, and provided for a rate of tax graded according to the amount of the legacy or share. Under the decisions in some of the state courts, such a tax would be invalid as wanting in intrinsic uniformity, but, the court held, in a learned and exhaustive opinion by Justice WHITE, all the judges concurring, that uniformity required by the Constitution in Federal taxation does not mean what the word "uniform" means, or the words "equal and uniform" mean in state constitutions. The former does not mean intrinsic, but only geographical uniformity. Geographical uniformity does not require that the objects of the tax must exist with uniformity in the several states. Taxes are uniform in the Constitutional sense, when they operate generally throughout the United States, and uniformly wherever the subjects of the tax are found.

Turning now to the interpretation of the words "equal and uniform" as found in the constitution of the several states: — The guarantee in the Fourteenth Amendment of the equal protection of the laws to all persons within the jurisdiction of the state has been involved in numerous cases of alleged discrimination, not only in taxation, but also in the exercises of the police power of the state.

The Supreme Court has declined to define what is the equal protection of the laws. In CONNOLLY vs. Union Sewer Pipe Company 184 U. S. 558, the court said, "What may be regarded as a denial of the equal protection of the laws is a question not always easily determined, as the decisions of this court and of the highest court of the states will show. No rule can be formulated that will cover every case, but upon this general question, we have said that the guarantee of the equal protection of the laws means that no person or class of persons shall be denied the same protection of the laws which is enjoyed by other persons or other classes of persons in the same place and in like circumstances."

The guarantee of the equal protection of laws, therefore, is directed against arbitrary discriminations in taxation, and in this sense, secures equality in taxation.

Digitized by Google

The equality which is protected by the Fourteenth Amendment is that which is inherent in taxation. There should be not only a public purpose pertaining to the district taxed, but also an apportionment by the legislative power levying the tax with reference to a uniform standard. If contribution is not required according to this principle of apportionment, equally and uniformly from all of the same class of subjects within that jurisdiction, it is not a tax but an arbitrary exaction. Equality and uniformity in this sense, like a public purpose, are involved in the very conception of taxation. Loan Asso. vs. Topeka, 20 Wallace 655.

One invariable limitation upon the power of taxation is that it must always be exercised for the benefit of the public, never for the advantage of individuals. Black's Constitutional Law, p. 385.

It is not necessary to uniformity and equality in this fundamental sense, that all the subjects of taxation in the states should be taxed in the same manner or by the same system of assessment. This would be impossible as the taxing power not only extends to property, but to occupations and persons. Even as to property taxation alone, the complicated conditions of modern industrial civilization and the mobility of many forms of personal property which effectually elude the tax gatherer, require special adjustments of taxing systems to insure even an approximation to equality in the distribution of public burdens.

VALUATION.

Equality of taxation requires equality in valuation as well as in rate of taxation. In the case of People vs. Weaver, 100 U. S., 539–545, the Supreme Court said that valuation is a part of the assessment of taxes. It is a necessary part of every assessment of taxes which is governed by a ratio or percentage. There can be no rate or percentage without a valuation.

It may not be out of place to say here, that in matters of accounting, the jurisdiction is properly vested in the Court of Equity. Under the exercise of Equity Jurisdiction there has

Digitized by Google

arisen a number of Equitable maxims, some of which we may now call to mind. "Equality is Equity." This maxim is chiefly applied in modern times to matters of accounting, marshalling, contribution, and in the settlement of incumbrances upon land.

In the matter of valuations where inequality is set up, it must be shown that the inequality constituting discrimination has been intentional and habitual, for the presumption is that the assessors have acted in good faith and in accordance with the law. "Equity imputes an intention to fulfill an obligation" is the maxim.

It is held that when the inequality of valuation is the result of a statute of a state designed to discriminate injuriously against any class of persons or any species of property, a court of equity will give appropriate relief, and also where, though the law itself is unobjectionable, the officers, who are appointed to make assessments combine together and establish a rule of valuation, the necessary result of which is to tax one species of property higher than others, and higher than the average rate. Equity will also give relief. In these cases, the maxim is "Equity will not suffer a right to be without a remedy." It is this maxim that lies at the foundation of Equity Jurisprudence. First National Bank of Chicago vs. FARWELL, 7 Fed. Rep. 518. National Bank vs. KIMBALL, 103 U. S. 732. STANLEY vs. Board of Supervisors, 15 Fed. Rep. 483, et al. Mere mistake in judgment, however, is no discrimination. Exchange National Bank vs. MILLER, 19 Fed. Rep. 372. Equity will rectify mistakes of fact. The maxims quoted are known as enabling maxims and do not restrain the injured party from seeking relief where relief should be granted.

Discriminations may be evidenced by undervaluations as well as by overvaluations. In referring to the constitutions of the several states, it is found that many states expressly declare that assessments shall be made upon a "full cash value," "a true cash value," at its "fair market value," or that a "just valuation of the property" shall be made.

Digitized by Google

Where the constitutions have not expressly qualified the value, it has been reserved to the legislature to enact laws stating the value upon which assessments are to be made. In order to determine the meaning of the expressions of equality of value, we have recourse to a number of decided cases. In Dickerson S. M. Co., vs. Randolph Tp. 25 N. J. Law 427, it is said that the law fixes a standard of value for the government of assessors, the actual value of the property, all property is to be assessed at its actual value, the amount it would realize at a public sale being a good criterion, but income derived from it is no criterion of value for the purpose of assessment.

With regard to the basis of valuation in the taxing of corporations and their stockholders, under an act of legislature. The capital stock is that paid in, and not the full amount of authorized capital. Phil. vs. Grays 52 Penn. 177. The stock is to be valued at its fair market value, not at its nominal or par value. The State vs. Tunnis 3 Zabriskie 546 (N. J.) The stock of a corporation, after deducting the valuation of its real estate, is to be assessed at its actual value, which may be either above or below par. Oswego vs. Dalloway, 21 N. Y. 449, National Bank of Commerce vs. City of New Bedford 175 Mass., 257, 56 N. E. 288, (1901).

Capital stock is never used to indicate the value of the property of a company. The value of the corporate assets may be greatly increased by surplus profit, or diminished by losses but the amount of the capital stock remains the same, unless changed by legislative authority. State vs. Morristown Fire Assoc. 23 N. J. Law 195; Boston & L. R. Co., vs. Commonwealth, 100 Mass. 399. (1868).

Value can only be determined by the ordinary selling and buying price for cash at the time, irrespective of the actual cost of the property. In this respect choses in possession, or tangible property, as to value, is governed by the same rules of law that apply to choses in action, or intangible property.

A manufacturing corporation that has been forced into a great expense in the building up of its plant, on account of local con-

Digitized by Google

ditions, may finally own a plant of no more value than another corporation which is more favorably situated as to local conditions, and so does not require the expenditure of so large a sum of money to produce a plant of equal capacity.

This may be illustrated in the case of a corporation which organizes a plant to produce a certain kind and quantity of goods. Some element of consideration has led the corporation to select a site for their buildings where extra heavy foundations are required adding greatly to the cost of the buildings. Another corporation organized for the same purpose as the first one, and to make the same kind and quantity of goods, may select a site for its buildings where only ordinary foundations, as footings, are required, resulting in a much less expenditure for buildings. The first corporation owns buildings that are of no more value for manufacturing purposes than the buildings owned by the second corporation. The first corporation is unfortunate in the conditions surrounding it.

In the cases of the City of Lowell vs. County Commissioners of Middlesex 152 Mass. 375, were involved the City of Lowell, The Merrimack Mfg. Co., The Tremont and Suffolk Mfg. Co., and The Mass. Cotton Mills. Upon appeal to the Supreme Court of Massachusetts, a question was raised as to the admissibility of evidence to establish a value. The court held that the evidence of what other manufacturing properties were valued at was admissible as a possible assistance in determining the cash value of the property in question, as the cash value was the point in issue, and not the proportionate value. In handing down its decision, the Court said that a fair cash value is irrespective of value placed by the assessors upon similar property in the same city. The question in issue was whether the property had been valued at more than its fair cash value, and not whether it had been valued relatively more or less than similar property of other persons.

What may be included in valuations is answered in the following decisions rendered by the courts of several states.

Digitized by Google

ELEMENTS OF VALUE.

In FITCH vs. PRUCHARD 5 Ill. 69, it is stated that all elements of value are to be considered in estimating land.

In estimating the value of land, assessors may take into consideration their proximity to a water power. State vs. FLAVELL 24 N. J. Law 270, which may be considered in connection with land and its valuation. Cocheco Mfg. Co., vs. STRAFFORD 51 N. H. 455. Boston Mfg. Co., vs. Newton 22 Pick 22. Canal Co., vs. Rockingham 37 Vt. 622.* So in valuing mill lands the capacity of the property for valuable use may be included in the valuation. Boston Water Power Company, vs. Boston 9 Metc. 199. Lowell vs. Middlesex Co., 6 Allen 131.

A mill site and movable improvements are to be listed and assessed as real property. Machinery is taxable as real estate and spinning machinery used in a factory constitutes a part of the improvements of real estate required to be assessed for taxation. Makepeace 9 Iredell 91. (N. C.) See cases cited in the Mass. Digest (1906) Vol. 7, p. 13815.

Part II.

VALUATIONS OF MACHINERY.

Valuations of machinery may be determined by one of two methods. One method is to determine its value from the physical condition alone, which may be called the direct method. The other method is to determine its value from its efficiency as a producer, by comparing its product as to quantity, quality, and cost of operation with that of the most improved machinery.

In making any valuation of machinery, it should be a rule of law that machinery which is a producer, in fact, has some intrinsic value greater than scrap. That is, a plant may contain some old machinery kept in daily operation turning out product which is sold in the market, and as such, is to be included as property having a capacity for valuable use.

---

*See Judson on Taxation for an extended discussion on the Law of Taxation.

Digitized by Google

This assertion appears to be sustained by the rule established in the case of the Boston Water Power Company, vs. Boston, 9 Metc. 199. (Ut Supra) Also in the following case, which may sustain the assertions made in the subsequent discussion of our subject. In the Troy Cotton and Woolen Mfg. Company, vs. City of Fall River, 167 Mass. 517; 46 N. E. 99; it was held that where it was found that the land, buildings and machinery of a mill, all of which are subject to local taxation, are in the aggregate, more valuable when used together for mill purposes than if separated, and all are owned by the same person or corporation, each should be assessed at its value when used in connection with the others, though the land would be more valuable for other purposes.

In the case of the Tremont and Suffolk Mills, vs. City of Lowell, 163 Mass. 283; 39 N. E. 1028, it was held that in valuing the real property of a manufacturing corporation for taxation, when the land must be valued exclusive of the buildings, and the buildings exclusive of the lands, it is erroneous to value land as if the buildings were removed from it, and then to value the buildings as if they were to remain upon it, if the sum of the value thus obtained is greater than the fair cash value of the land and buildings taken together in the condition they were in at the time to which the valuation relates.

By the rulings established in these two cases, it appears that certain species of property may be either appreciated or depreciated in value, as it may be used in connection with other property, or to be a little more specific, the roving frames in the card room of a cotton mill may be of less value when used in connection with old style pickers and American top flat cards, than if they were used in connection with the modern pickers and revolving flat cards. On the other hand, the old-style picker and American top flat cards actually in use in a cotton mill, as an integral part of the organization, are more valuable as producers, than a mere scrap value.

DIRECT METHOD OF VALUATION.

In presenting the evidence to establish the value of machinery

Digitized by Google

by the direct method, we may proceed by ascertaining the cost of replacing the machinery if new, at the present prices, then depreciating this value for age and wear. In determining the percentage of depreciation to be charged, the physical condition of the mechanism will be accounted for as well as the general appearance of the product.

Cases may arise where the direct method of valuation is the only true method to be employed, as for example, where it is wished to obtain the value of machinery that may be classed as modern. The result may show that the cost of manufacturing goods with this machinery is fully as economical as in the newer modern mills, and that the product maintains a status in the market, under competition, equal to that of any modern plant making the same kind of goods.

COMPARATIVE METHOD OF VALUATION.

In presenting the evidence to establish the value of machinery by the comparative method, we may proceed to ascertain, from the organization of the plant, the quantity, quality of the product, and the cost of operating the machinery in issue. Then by comparison with a modern well arranged plant, containing the most improved machinery, organized to produce the same quantity of the same kind of goods, and of equal quality, we then show what, if any, will be the saving in cost of manufacture in the modern plant.

The presumption is that with a well arranged organization of machinery in a modern mill, the quality of the product will be better. A better quality of product might result in obtaining a higher price in the market, or it might enable the organization to maintain its status under competition, but the question of intrinsic value of the goods by comparison as having any weight to influence the value of the machinery is probably too contingent to be considered in evidence. This assertion appears to be sustained in the case of Dickerson S. M. Co., vs. Randolph Tp. 25; N. J. Law 427, where it is held that income derived from property is no criterion of value for purposes of assessment. (Ut Supra, p. .)

Digitized by Google

To determine the value of machinery by the comparative method, we ascertain the cost of the most improved machinery that will replace the existing machinery, which we will call the replacement cost. We next ascertain the difference in cost of manufacture in favor of the modern machinery. This difference should be properly capitalized as representing a value in capital deducted from the investment in the existing plant, earning enough to pay the fixed charges on the plant equivalent to the amount saved. Then the replacement cost should be reduced by the value of the saving capitalized and the result will be the value of the existing machinery, if new. This last value should then be further depreciated for age and wear.

FIXED CHARGES.

The fixed charges include taxes, insurance, interest on the investment, depreciation, and repair charges.

Tax Rates. — The report of the Statistics of Labor for the Commonwealth of Massachusetts, in its thirty-sixth annual report, 1905, page 61, states that the taxes per $1,000.00 of value of land, buildings, machinery, tools and implements for the period beginning 1900 in Massachusetts, averages $17.11, in Georgia, $10.69; in North Carolina, $5.78; in South Carolina, $7.57.

Insurance Rates. — Insurance is not based upon any specific rating by the mutual companies. Each plant is severally considered, but an approximate rating may be said to be from 50 cents per $100.00 of value, to 75 cents per $100.00 of value. Some of the older plants where the protection is not so adequate as that of the more modern plants, may be assessed at the rate of $1.00 per $100.00 of value. Premium rates are usually further reduced by dividends.

Interest on Investment. — The rate of interest that money can be borrowed for is averaged fairly at about five per cent. Recent market quotations gave the value of money at four and a half per cent. to five per cent.

Depreciation of Plant. — If the rate of depreciation is taken at about two and a half per cent. on the capital invested, and if

Digitized by Google

this amount should be set aside as an annuity drawing interest at the rate of four per cent. compounded annually, in about twenty-five years the accumulated annuities, coupled with the probable cash value of the plant at the end of this period, would be able to pay for a new plant.

In addition to the depreciation charge, there must be a certain amount of repairing done which may be a fairly uniform charge from year to year.

Total Fixed Charges. — Assume taxes and insurance to be 1.75 per cent., interest on the investment 5 per cent., depreciation and repairs about 3.25 per cent. The sum is 10 per cent. which is an easy figure to handle and is fairly accurate.

SAVINGS CAPITALIZED.

If a saving of $1,000.00 per year is shown to be possible in substituting a modern machine for an old machine, and the total fixed charges are 10 per cent., then $1,000.00 capitalized at 10 per cent. equals $10,000.00; $1,000.00 capitalized at 11 per cent. equals $9,100.00; $1,000.00 capitalized at 12 per cent. equals $8,333.33.

EXAMPLE OF VALUATION OF MACHINERY BY COMPARISON.

Let it be assumed that we wish to determine the value of a certain equipment of machinery contained in a cotton manufactory organized to make standard print cloth sixty-four square, twenty-seven and one half inches wide.

The organization of the machinery in issue is made up of American top flat cards and railway heads, ring warp frames and mule filling making yarn from single roving; and plain looms.

The schedule of the machinery is exhibited in *Table I, Appendix.*

For purposes of comparison, we will show how this equipment may be replaced by modern machinery organized to make the same kind and quantity of goods. The modern equipment

Digitized by Google

will contain revolving flat cards, two processes of drawing, all ring spinning making yarn from double roving; and Draper looms.

The schedule of modern machinery is exhibited in *Table II, Appendix.*

The comparison of the costs of manufacture between the machinery to be valued and an equipment of modern machinery is exhibited in *Table III, Appendix.*

COMPARISONS.

From Table I it is seen that a plant of 23,520 spindles, which will produce about 1,200,000 pounds of cloth per year, equipped with the old style of machinery will cost, if new, about $202,000.

From Table II. it is seen that the above plant may be replaced by an equipment of modern machinery to contain 18,816 ring spindles at the cost of about $207,000. which will produce about 1,200,000 pounds of cloth per year.

The inference to be drawn by comparison is that the sum of $202,000.00 fairly represents the replacement cost of the machinery in issue.

From Table III it is seen that the saving in the cost of manufacture in favor of the modern mill due to the cost of operating the machinery, is represented by a sum of about $16,300.00 as applied to the whole equipment. This saving capitalized at 10 per cent. equals $163,000.00.

DETERMINING THE VALUE.

By way of comparison, it is shown that the replacement of the machinery in issue may be fairly stated as $202,000.00; that the capitalized saving in favor of a modern equipment is about $163,000 00, then the value of the machinery in issue, if new, would be the difference between these two, or $39.000. As the depreciation of the machinery for age and wear is about 60 per cent., then the fair cash value may be stated to be about $16,000.00, or about 8 per cent. of the replacement cost, if new,

Digitized by Google

or about sixty-eight cents per spindle. The age of the machinery in issue being about sixteen years.

REMARKS.

The example given will be found, by inspection, to cover nearly all the authorities cited, especially the rulings laid down in the cases of the Troy Cotton & Woolen Mfg. Co., vs. City of Fall River and the Tremont & Suffolk Mills, vs. City of Lowell. Both these cases were decided in the middle part of the decade beginning 1880 A. D.

No assumptions have been made, probably, that cannot be modified or determined to meet the facts as they may be found to exist in any specific case.

This leads eventually to the third and last part of our subject in which the law as to the admission of evidence to establish the value by the comparative method will be considered briefly.

Part III.

LAW OF EVIDENCE.

Where a case for the abatement of taxes is brought up by appeal before the County Commissioners, or before a commissioner appointed by the Superior or Supreme Judicial Court, it becomes necessary to introduce evidence of an expert nature, to assist the commissioners, who in these cases, act in the place of a jury to determine the facts in the case.

The testimony of expert witnesses may be distinguished as of two classes, namely: expert testimony as to facts, and expert opinion.

Expert witnesses testifying as to facts, are really not so much expert witnesses, as they are specially qualified witnesses, who, by reason of special opportunities for observation, or for their wide experience in the subject upon which they are called for testimony, are in a position to judge of the nature and effect of certain matters better than persons who have not had oppor-

Digitized by Google

tunities for like observation. Under this class of evidence, may be proved the unwritten foreign law, the interpretation of statutes of foreign states, the physiology and anatomy of the body, the value of property and other questions involving special knowledge or training.

Expert opinion evidence, strictly speaking, requires of the witness some special course of training or education qualifying him to give opinions of peculiar value on certain matters. The distinction may not appear very marked in some cases, still the distinction exists. In the case of MILLER vs. SMITH, 112 Mass. 470, it was said that whenever the value of any peculiar kind of property, which may not be presumed to be within the knowledge of all jurors, is in issue, the testimony of witnesses acquainted with the value of similar property is admissible, although they have never seen the very article in question.

The value of the expert testimony is to assist the jury in determining the facts in the case, and if the jury find the facts not to be as assumed by the expert, they are at liberty to discard his evidence entirely. An expert witness called upon to testify is required to show himself qualified to give his testimony as an expert in the matter in which he is called upon to testify. Having shown the Court that he is qualified by his experience, or superior knowledge, this testimony may be admitted as evidence.

It is wished to established the value of the machinery given in the example in Part II, upon the testimony of expert witnesses. The expert is called to the stand and is qualified. The expert has stated that he has examined this machinery and is prepared to give it a value. The examining attorney asks the expert, "What in your opinion represents its fair cash value?

What will the expert answer? He knows from experience and observation what will be required in a modern plant to produce the same kind and quantity of goods as the machinery in question produces. He is prepared to substantiate any claims he may be called upon to make as to what a modern plant does, similarly organized. He is also prepared to show from actual

Digitized by Google

results, the saving in the cost of operating the machinery in a modern plant over the old plant. He is in a position to draw a comparison as to the value between the old and the new, and he does so. He can show that the capacity of the old machinery, for valuable use, is not so great as that of modern machinery. In giving his answer he depreciates the value of the old plant by the amount of saving that can be shown in favor of the modern plant due to using improved machinery.

IS THE ANSWER JUSTIFIED?

In the case of Farmington River Water Power Company vs. Berkshire County Com. 112 Mass. 206, at a hearing before the County Commissioners for the abatement of a town tax assessed upon a reservoir dam and the land flowed by it, testimony as to the benefits derived in their property and business from the water power by parties other than the owner, is admissible on behalf of the town to show the value of the reservoir, by reason of its capacity for valuable use, and to disprove the petitioner's allegation that it was of merely nominal value.

It appears that this ruling may justify the showing of capacity for valuable use, and may also operate to restrain the placing of too low a value upon property.

How can capacity for valuable use be shown except by comparison directly or indirectly with what the property might do if properly developed, or with other property similarly situated that has been developed?

On a petition for a writ of certiorari by the City of A against the County Commissioners in the matter of the abatement of taxes assessed upon certain mill property. It was held that evidence as to what mill water power was worth in B was competent if the conditions which affected the value of water power were substantially the same in both places. City of Lowell vs. County Com. 146 Mass. 413.

The point raised in issue in this discussion is that while it may be admitted that the capacity of the old machinery for valuable use has been fully developed, yet this capacity has reached

Digitized by Google

a maximum, and by the further development of improvements in the same type of machinery the value of the capacity of the old machinery for use has been depreciated, and that the value of a modern plant similarly situated, and affected by the same conditions as the old plant, may be shown in evidence to asisst in establishing the fair value of the old plant.

If the expert witness bases his answers on mere guess work the opposing side may properly object to the evidence submitted, and by the law of evidence, such objection is well taken and will be sustained. PRIEST vs. NICHOLS, 116 Mass. 401.

GENERAL SUMMARY.

Part I.

The words "Uniform and Equal" as defined by the United States Courts mean geographical uniformity and equality.

As defined by the State Appellate Courts, mean intrinsic uniformity and equality.

The word "Value" as used in reference to taxable property means fair cash value, or the price a willing purchaser pays a willing seller in a voluntary sale where there is a free choice on the part of the purchaser.

Value is not necessarily represented by the cost of a thing.

Capacity of property for valuable use is an asset in land subjected to a tax, and improvements in land represent a taxable value.

Part II.

In assessing the value of property for the purpose of taxes, where one species of property is used in connection with another species of property, that it is error to separate the two species from each other, if by the separation their value would be greater or less than when used in connection with each other, — as buildings used in connection with lands, or machinery in a mill.

Part III.

Evidence is admissible to show the capacity of property for valuable use.

Digitized by Google

APPENDIX.

TABLE I.

SCHEDULE OF MACHINERY TO BE VALUED.

Picking, Carding, and Roving Machinery.

Number and Name of Machines.	Price.	Cost if New.	Date.	Per Cent. of Depreciation.
3 Feeders and Openers with Trunks, 36″	$800.00	$2,400.00	1889	70
3 Breaker Pickers, one beater, 36″	800.00	2,400.00	"	"
3 Inter. " " " 36″	750.00	2,250.00	"	"
3 Finisher " " " 36″	750.00	2,250.00	"	"
95 Breaker Cards Am. Top Flat, 36″	225.00	21,375.00	"	"
1 Doubler and Carrying Frame for laps,	400.00	400.00	"	"
106 Finisher Cards, Am. Top Flat, 36″	225.00	23,850.00	"	"
12 Railway Head and Sliver Boxes,	225.00	2,700.00	"	"
36 Del. Drawing, Metallic Rolls,	75.00	2,700.00	1904	5
6 Slubbers 12″ x 6″ x 52 sp.=312 sp.	14.08	4,303.00	1889	70
10 Inter. Fr. 10″ x 5″ x 84 sp.=840 sp.	10.08	8,467.00	"	"
20 Roving Fr. 7″ x 3½″ x 160 sp.=3,200 sp.	6.15	19,680.00	"	"

Spinning and Dressing Machinery.

60 Warp Fr. 2¾″ ga. x 176 sp.=10,560 sp.	$3.13	$33,053.00	1889	50
18 Mules 1½″ ga. x 720 sp.=12,960 sp.	2.50	32,400.00	"	"
Total, 23,520 sp.				
8 Spoolers 4″ x 5″ spools x 100 sp. each= 800 sp.	3.25	2,600.00	"	"
8 Warpers 420 spools each,	225.00	1,800.00	"	"
2 Slashers complete,	1,400.00	2,800.00	"	"

Weaving Machinery.

730 Plain Looms 28″	50.00	36,500.00	1899	50
		$202,018.00		60

Production=1,200,000 pounds per year.

Digitized by Google

TABLE II.

SCHEDULE OF MODERN MACHINERY TO REPLACE MACHINERY IN ISSUE.

Picking, Carding and Roving Machinery.

Number and Names of Machines.		Price.	Replacement Cost.
2 Feeders and Openers with Trunks,	36″	$800.00	$1,600.00
2 Breaker Pickers, one beater,	45″	850.00	1,700.00
2 Inter. " " "	45″	800.00	1,600.00
2 Finisher " " "	45″	800.00	1,600.00
26 Revolving Flat Cards 27″ doffer.	45″	680.00	17,680.00
48 Del. Drawing, Metallic Rolls, two processes,		75.00	3,600.00
4 Slubbers 11″ x 5½″ x 64 sp.=266 sp.		12.64	3,362.00
8 Inter. Fr. 9″ x 4½″ x 100 sp.=800 sp.		9.15	7,320.00
20 Rov. Fr. 7″ x 3½″ x 160 sp.=3,200 sp.		6.15	19,680.00
Spinning and Dressing Machinery.			
42 Warp Fr. 2¾″ ga. x 224 sp.=9,408 sp.			
42 Filling Fr. 2¾″ ga. x 224 sp.=9,408 sp.			
Total, 18,816 sp.		3.25	61,252.00
5 Spoolers 5″ x 5″ spool 120 each=600 sp.		3.50	2,100.00
6 Warpers Cone drive 420 sp. each.		275.00	1,650.00
2 Slashers cyl. 7′ and 5′ complete,		1,400.00	2,800.00
Weaving Machinery.			
580 Draper Looms 28″ E Model,		140.00	81,200.00
	Total cost,		$207,144.00

Production=1,200,000 pounds per year.

Digitized by Google

TABLE III.

Comparsison of cost of manufacture between old plant and modern plant.

Column A represents old plant.

Column B represents modern plant.

Column C represents difference in favor of modern plant.

DEPARTMENT.	A.	B.	C.	Total Annual Saving.			
	Cents.	Cents.	Cents.				
Picking, Carding and Roving,	0.98	0.86	0.14	1,250,000	pounds.	=	$1,750.00
Warp, Spinning and Dressing,	1.10	1.08	0.02	675,000	"	=	135.00
Filling Spinning,	0.82	0.66	0.16	530,000	"	=	848.00
Weaving,	3.40	2.27	1.13	1,200,000	"	=	13,560.00
					Total.		$16,293.00

The PRESIDENT. We shall now adjourn until two o'clock, and I ask you to be here promptly at that hour.

Digitized by Google

SECOND SESSION.

WEDNESDAY AFTERNOON, APRIL 24, 1907.

The Association met in Huntington Hall, at 2 P. M., the President in the chair.

The PRESIDENT. Gentlemen will you come to order, please. Mr. WILLIAM W. CROSBY desires to present a matter of interest to the Association in connection with the national committee on Industrial Education. You will hear a brief statement by Mr. CROSBY.

INDUSTRIAL EDUCATION.

Mr. WILLIAM W. CROSBY. Mr. President and members of the Association: Allow me to thank you in advance for a few minutes in which I may present to you a matter of interest in connection with the National Society for the Promotion of Industrial Education which has organized an inquiry into the textile field in a small way, and has asked me to serve as secretary of the sub-committee. It will be necessary to secure a certain amount of data. I hope that this may be done by personal interviews, although in some cases it will have to be

Digitized by Google

by correspondence. Perhaps you will be good enough upon receiving requests for information, to remember that the matter has been formally before our Association. The state of Massachusetts is well provided for inquiry into this line through its own Commission on Industrial Education, but for the rest of the United States there is little or nothing being done. The committee, through Professor RICHARDS, who is the secretary, has hoped to approach the manufacturers and know what, if anything, might be done during the years of compulsory education in the lower schools for those who are going to work in your mills. We know what is being done by the textile schools for those who are going to fill the higher positions, but we realize there must be some people to carry bobbins and to fill boxes, and to doff, etc. What, if anything, can be done for them, and in my mind the question comes up, what can be done to give you a field from which to select second hands and in the larger mills, third hands. It is with a view to helping out this side of the case that the present inquiries are to be instituted. They cannot all be second hands, but we must have a great many more second and third hands than we have overseers, and surely more than superintendents. So, if we may have a certain amount of your co-operation, we hope it will be to the credit and to the good of all. This will enable me to put the statement on the record and I will not detain you longer now, except to ask you to remember that there is such a thing as this inquiry and who is making it, and that it has come properly before this Association.

The PRESIDENT. Are there any questions that you would like to put to Mr. CROSBY in regard to this Industrial Education work?

The PRESIDENT. In view of the recent attack upon the New York Cotton Exchange and the investigation which is to be conducted by the Bureau of Corporations, it seemed to me to be important to have at this meeting an authoritative statement

Digitized by Google

regarding the New York Cotton Exchange and its cotton contract. It is a subject which we need information about; as manufacturers we want to understand it more thoroughly. We are very glad to have with us this afternoon Mr. SAMUEL T. HUBBARD, who is an ex-president of the New York Cotton Exchange and who will speak upon this topic. [Applause].

Mr. SAMUEL T. HUBBARD. May I express my deep appreciation of the indefatigable energy and undying courtesy of your President, Mr. MACCOLL, in promoting the welfare of this organization, which has made his presence and his name as well known in all the cotton exchanges of the world as in your Association. And may I also state in answer to the suggestion which he made this morning, that the Cotton Exchange of New York would welcome the foundation of a Cotton Exchange in New England; that we invite all the competition that is possible; that if we have no economic reason for existence in the movement of the cotton crop of the United States, we cannot compete with a cotton exchange in New England; and that we also welcome and open all our books and methods of doing business to the Department of Commerce and Labor and the Bureau of Corporations, which is now engaged in investigating all of the cotton exchanges, and all of the different cotton associations of the United States.

Digitized by Google

THE NEW YORK COTTON EXCHANGE AND ITS CONTRACT FOR DELIVERY OF COTTON.

SAMUEL T. HUBBARD, 66 Beaver St., New York City.

It is a great personal compliment to be requested to appear before your Association and again address you when the recollection of my previous appearance can scarcely have faded from your memories. It is an honor which I thoroughly and deeply appreciate — out, in this period of almost universal condemnation of mercantile organizations which have developed from the wonderful changes in methods of electric and steam communication; and the consequent instant decision demanded of the merchant, speculator and spinner, in the movement of the cotton crop to the various markets and into consumption. Allow me to extend to you my sincere congratulations and those of the cotton trade upon the marvelous prosperity of the cotton spinners during the past two years and a half, a condition, if half of what we hear of the inability to obtain goods for immediate delivery is true, promises to continue well into next year. Certainly it is an extraordinary condition of commercial and industrial prosperity which calls for the employment of all the increasing spindles of the world at full time and which enables you to sell the product of your mills for forward delivery for months to come.

May I also state that it is an exceedingly great pleasure to appear before you in this historic city of Boston, the home of those brilliant merchants, who, laying the foundations of their fortunes by trading with the East Indies, West Indies and China, finally turned their attention to the production in New

Digitized by Google

England of those cotton fabrics which, at that time, they were compelled to purchase in London or Manchester.

It is to their realizing the possibilities of the profits arising from the manufacture of cotton goods which led them to speculate in the building of the cotton mills in New England, a speculation which became as the business prospered, so enviable and widely distributed an investment that I have heard it stated the declaration of dividends by the cotton mills meant either joy or disaster to the inhabitants of Boston.

When I had the pleasure of addressing you five years ago, I was asked if I thought the cotton crop could possibly reach a total of ten and one-half million bales when the government estimate was 9,760,000 bales of 468 pounds, and I recall my answer that I thought it would reach ten and three-quarters million bales of 500 pounds, while now we are expecting a crop of thirteen and three-quarters million bales on a government estimate of 12,546,000 bales, which have already come into sight, a wonderful exhibit of the expansion of the growing of cotton and of the continued inaccuracy of the government estimates of the crop. Then the merchants were prosperous while the spinners were not, while this season the cotton merchants have had the worst business in a generation, while the prosperity of the spinners is unparalleled.

It has been my good fortune to have entered the cotton trade as a boy at a period when it was emerging from the chaos resulting from the Civil war, and to be connected with it from before the incorporation of the New York Cotton Exchange in the spring of 1871, until the present time. To have witnessed the changes from time to time in its basis contract, its different methods of classification and delivery, and the different systems which have been used to establish the differences between the grades, and during all that period I can only recall one prominent spinner who became a member of the exchange — that was Mr. W. T. GARNER, of Messrs. Garner & Co., — and strange to relate, the first corner in our market after the formation of the exchange, was under his management in July, 1872. The

Digitized by Google

hostile attitude taken by the spinners of New England at the formation of our exchange, and which has continued with more or less intensity during the past thirty-six years was, and is, to my mind, a mistaken policy which the spinners of England and continental Europe have avoided by their daily intercourse with merchants from all portions of the world.

Little did the cotton trade of New York expect that in so short a space of time the organization which they then formed to regulate the trade in New York, would become a cosmopolitan organization, embracing members from Moscow, Smyrna, Alexandria, and the European centres of Havre, Bremen and Liverpool — or that from a provincial market it would, through the methods of trading then adopted, become the dominant cotton market of the world. In fact, I am not far from the truth in stating they never thought such a condition possible. What they intended to do is to be found in the charter granted to them by the state of New York, namely:

"To maintain a suitable building in the city of New York — to adjust controversies among its members, to establish just and equitable principles in the trade, to maintain uniformity in its rules, regulations and usuages, to adopt standards of classification, to acquire, preserve and disseminate useful information connected with the cotton interests throughout all markets, to decrease the local risks attendant upon the business and generally to promote the cotton trade of the city of New York, increase its amount and augment the facilities with which it may be conducted. The said corporation shall have power to make all proper and needful by-laws, not contrary to the constitution and laws of the state of New York or of the United States.

If you will carefully read the duties committed to it by this charter you will agree with me that the corporation has carried out the obligations committed to it by the State with marked intelligence, ability and foresight.

Their actions have at times been so far in advance of current opinion that they have been violently attacked and subjected to calumny, indignity and scorn, only to have the course of

Digitized by Google

events prove their actions were the result of broader views than hose who, through ignorance, led in reviling them.

At the formation of the exchange three different and distinct contracts for the delivery of cotton at some future date were presented to them for consideration and adoption:

First. A contract for the delivery of cotton of an even running grade.
Second. A contract for the delivery of an average grade.
Third. A contract for the delivery of all merchantable grades on a basis price for some fixed grade, with additions or deductions for the other qualities delivered.

After careful discussion and deliberation, it was decided that the risk to the individual in attempting to fill either an even running grade contract, or an average grade contract, was so hazardous that it could only be assumed and regulated by the individual himself, that it could neither be assumed nor regulated by any body of merchants as binding upon each other.

Permit me to illustrate this risk and you will instantly perceive the impossibility of measuring it from a community standpoint. My friend, your president, Mr. MACCOLL, spins I understand a grade of yarn from an 1¼ inch good middling cotton, the mills at Fall River use one inch cotton somewhat better than strict low middling, while some of my friends use only middling stained cotton. In fact, very few mills use exactly the same quality and staple.

Now the risk taken by the merchant in securing or contracting for these cottons of different staples and qualities is so great that no one merchant should say to another or compel another to limit the value he may place upon his services to obtain them.

Experience has shown the decision of the founders of the exchange in refusing to adopt either an even running contract or an average contract to have been correct. Their example has been followed by all the other exchanges and the even running contract offered from time to time by shippers for export has resulted in such losses to both shipper and receiver that the

Digitized by Google

methods of buying cotton for foreign shipment have been almost entirely altered.

Thus we are confronted with the basis contract; "basis low middling, nothing below good ordinary or above good middling" was first adopted, which with changes from time to time made at the earnest request of southern shippers, is now in force excepting that the basis has been changed from low middling to middling and from good ordinary to fair. We have, therefore, a contract for the delivery at present of full grades with one-fourth and one-half grades in all 30 in number which is directly attacked as unmerchantable, unspinnable and in all respects detrimental alike to both shipper and spinner.

There are eleven grades, the others are one-fourth and one-half grades, the necessity of the one-half grades as strict good ordinary, strict low middling, strict middling and strict good middling are admitted by everyone. The fault is found with barely low middling or fully low middling; now it happens in the grading of cotton that a bale is better than low middling but not strict low middling; where shall *it* go, or a bale is better than strict good ordinary and not low middling, where shall *it* go. If these samples were laid out with a line of low middling they would be accepted as average low middling. They represent the effort of the exchange to do exact justice to both shipper and receiver to the utmost question of value. However, these one-fourth grades will cease to exist in the contract after January 1st, 1908, having been eliminated by the exchange as have been the three lowest grades of stained cotton in answer to the agitation of the past season. As less than 1,500 bales in 400,000 bales inspected during the past two years have been of these stained grades they were hardly noticeable in the contract except to provoke criticism.

All cotton delivered on a contract is classed by a paid board of experts and can be retendered without reclassing for the period of a year. If the class be found incorrect there is a fund to pay any claim. In these features of paid classers and of a guarantee fund, the *New York Cotton Exchange stands alone* in the world, not only in cotton but in other commodities.

Digitized by Google

Nature provides each cotton plant with three distinct crops, the lower, middle and top crop. Each crop is grown from five to twenty or more bolls; each boll opens at a different time and under different weather conditions. Therefore there must be variety in color, grade and staple. The top crop is usually tinged and stained by the frost, colored but not unmerchantable or unspinnable by mills who use these grades, but who cannot use the higher grade, therefore they are entitled to the same privilege as the others.

To limit the grades in a contract is to invite manipulation; a self-evident proposition not calling for discussion. The policy of the exchange has always been to give every opportunity to deliver cotton, to prevent manipulation, in the belief that demand and supply should rule instead of manipulation which is always detrimental to the best interests of all. When cotton is tendered it is sampled, inspected and classed by the representatives of the Exchange, the owner committing his interest into their hands and having no voice in determining the sampling, classing or rejection; another unique provision of the trade of New York.

We have discusssed the contract and the method of the delivery of cotton upon it; we now will consider the question of the differences between the grades and the methods of determining them. There are two methods of arriving at the value of different grades of cotton tendered on a basis contract. One, the method in use in Liverpool and Bremen of determining the grade by *value* regardless of the classification of the cotton; that is of determining by arbitration or by experts what the cotton is worth on or off middling when the cotton is delivered. Whether it is 10, 15, 18, 22 or 58 points on or off the value of middling cotton on that day, and this decision only stands for that *particular* day. It may be retendered the next day and the value will be different. A source of endless disputes and dissatisfaction. No one knows what will be the deliverable value of the cotton he has on hand from day to day. That is the foreign method which we have tried and abandoned as unjust.

Digitized by Google

The other is to have the grade or class of each bale determined on samples drawn by the receiver in the presence of and divided with the deliverer, by an arbitration of experts. The decision as to the grade holding good only for that day and that delivery. To retender the cotton the same process is gone through with and the next arbitration of experts may differ as to the grade (experience has shown they usually do) so that it is impossible to redeliver the same class and value as received. This is the system in use in New Orleans. We have tried it and abandoned it as unjust.

In its place we have committed the sampling, classing and grading of the cotton to a bureau charged with these functions and their samples and grade hold good for a year without extra handling or cost.

We have now left the question of when or how shall be determined the question of the value of different grades. Shall it be determined by a large or small committee, chosen for that purpose by the board of managers? Shall that committee be changed from month to month or from year to year? Shall that committee meet daily, weekly, monthly or two or three times a year?

All these different ways of reaching a decision on this subject are now in use in other markets and have been in use on our exchange in the past. We have tried them all after long and violent discussion as to the benefits and disadvantages of each, without reaching that millennium, "a perfect system" of suiting everyone upon a question directly affecting the pocket nerve of everyone in the trade.

A small committee of three or five is susceptible to influences affecting the value of the different grades, that is the experience of all markets in any commodity. We have tried a small committee and found the method a failure.

A large committee representing every interest, shipper, exporter, spinners' brokers and speculators, is the best we know. It must contain many different interests; in their discussions and deliberations a determination should be reached by a majority

Digitized by Google

vote, which should closely approximate the correct value. The ideal correct value to each individual is what he believes is right, not what anyone else thinks right.

Like the old Scotch woman who "Had her doobts about the Meenister"—but knew one who was certainly bound to be saved.

On the revision committee of our exchange are members from Vicksburg, Augusta, Boston and Fall River, in order that all interests should have a voice. No other exchange invites any of its non-resident members to act upon such a committee. Their conclusions are reached by a majority vote and while they make mistakes, as we all do, a majority of seventeen members, representing different interests and members of long established firms, should be nearer correct than a small committee in reaching their decision.

We have found it best to have a committee, selected annually by the board of managers at a time, before the crop is gathered, that no one may know what their interests may be when they meet. Shall this committee meet daily, weekly, monthly or two or three times a year? That is a great problem. We have had all methods, we have had them all unmercifully condemned, simply because they involved a principle upon which it is impossible to suit everyone. If you receive cotton at one valuation you wish that valuation to remain permanent until you redeliver it or sell it. That is human nature.

We finally reached our present method by a process of evolution and elimination, realizing that while it may not be perfect it was the best and fairest to all.

Our reason for this view is this, here is a basis for contract delivery which will remain unchanged for nine months, if during that time, it is found wrong the measure of error will be determined not by a committee appointed from time to time but by the cotton world trading in all the markets by the value they place upon our contracts.

The shipper knows the difference between the grades will not be altered while his cotton is coming to New York for delivery,

Digitized by Google

the spinner knows that he has bought his hedge at a price representing the discount at which the world believes the grade of cotton likely to be tendered to be worth, and he also knows that if he receives it he can retender it at any time without loss as to valuation — something impossible in New Orleans or Liverpool.

In short, the system has been found to be so fair that it has not been adopted in other markets who have retained the other old systems we have discarded. If these other markets find a shipper sending cotton not immediately wanted they lower the valuation of that grade and cause him loss. If they find a spinner liable to take up the cotton which should be tendered they are apt to raise the valuation. But you answer, look at the difference in your market between middling quotations and contracts; how do you account for that? Does not that show your system is wrong? Does not your system draw undesirable cotton to New York that spinners cannot use?

Let us take these questions in order:

First. A difference between middling evening running quotation and basis contracts must, and does, exist in all markets. In coffee the basis grade number seven is selling at seven and one-quarter cents with May contracts at five and three-quarters — a difference of one and one-half cents a pound because all the coffee delivered on contracts is of very high grade. In cotton seed oil, prime oil is selling at forty cents, while basis prime is selling at thirty-two cents, a difference of four dollars a barrel due to the scarcity of prime oil. Doubtless instances could be found in other trades with a little research.

Second. The quotation committee knows that the quotations for middling cotton in New York is used as a basis for the sales of yarns and the purchases of cotton by spinners, so that when middling is difficult to find and the supply nominal the quotation for this grade must in justice to all, represent what that grade is worth in New York if it could be found and brought there.

This is true whether the crop be a good one or poor one.

Digitized by Google

In New Orleans the difference at the time of writing (April 1st) is fifty points, and in Liverpool the difference is seventy-two American points, though both markets alter differences from week to week and from day to day and the value of your contract is changing either for the better or for the worse daily.

Third. Our differences show the value of the cotton delivered on a basis contract as considered by the cotton trade as a whole and when you buy, you buy at a discount as compared with middling which the world believes to be correct.

If you buy at a discount you can sell at a discount, the only question is, does the world correctly estimate the discount at the time you buy? During 1905–06 we had a large stock of high grades and the contract was at a discount; this season we have a smaller stock of low grades and the discount exists. During the Sully year we had a stock of high grades which were carried over because the spinners all wanted the lower grades at the lower price. Strict good middling was declared unsalable in Liverpool in July of that year.

Fourth. The character of the cotton consigned to any market for sale is the cotton which cannot be immediately sold to the spinner. It is composed of either high grades or low grades, good staple or poor staple, just as the surplus consists of either the better or lower qualities. Strange as it may appear in this season of scarcity of the high grades, both of the qualities can be undesirable if the spinner does not need them.

In November, 1905, we had in New York 230,000 bales of high grade good staple cotton; the spinner did not want to receive them on contract at a discount of forty to sixty points below middling, the speculator thought it an outrage to ask him to take them, and they were thrown over into the hands of the merchants who in less than six months sold them all to the spinner at a handsome profit. In my opinion the same will be true of our low grade stock in New York today.

During my long connection with the New York market, I have never known a spinner's broker (we never see the spinner) describe the stock of cotton in New York except as undesirable

Digitized by Google

and not what any spinner wants or could use, until I expect him to begin all conversation with that statement or with a similar one that the spinner has enongh stock to last him until October and simply buys this little lot as an accommodation to me. So far this season 50,000 bales of our condemned and belittled, undesirable, unspinnable stock has been sold to spinners at a premium over contracts, and when the fashion for ladies' wear changes from fine white to colored goods, it will all be sought after at a premium. That is a merchant's business to buy what you don't want and hold it until you do, and he usually makes a living by so doing.

In Liverpool at the present time there is an effort being made to induce them to adopt the New York method, and I beg to quote the following letter from the Manchester Guardian, written by a prominent importer of cotton, (HOOPER).

"Those who notice that our stock of American cotton is nearly 1,000,000 bales wonder why near "Futures" are selling at 200 points over New York and 25 points over "New Crops." It is because we have a contract which is a boon to manipulators, but which has become a hedge for neither spinner nor merchants. In 1902 I sent a printed circular to each member of the Liverpool Cotton Association, advocating the adoption of a fixed difference contract. Every year I am more convinced that fixed differences must come if our future contract is to continue useful for trade purposes.

A "Basis" future contract should be the same as a "Basis" c. i. f. and six per cent. contract—*i. e.* the differences between qualities should be fixed when the trade is made; but, unfortunately, we treat our "Futures" the same as a contract for even running c. i. f. and six per cent. cotton, and fix the differences on the day of delivery. This allows the manipulating straddlers to fix differences to suit themselves to a great extent. When the manipulating straddlers have an enormous line of futures purchased in Liverpool it pays them well to offer cotton (which has been tendered), especially to arbitrators and members of the quotation committee, at a very cheap basis, as by so doing they induce the former to undervalue the next cotton tendered and the latter to reduce quotations for the grades being tendered; each succeeding tender then becomes worse for the seller, and the near positions and futures generally

Digitized by Google

are forced much higher than supply and demand warrant. Under the present system it is quite conceivable that a little judicious bidding for actual cotton may make a vast quantity deliver at 25 points more, or a little judicious offering make it tender at 25 points less than it would if the market was normal. A fixed difference contract would be fair for all—better for the legitimate trader, both buyer and seller. Many think that the New York market is injured by having fixed differences. It could not exist without them.

R. H. HOOPER.

Liverpool, February 19th, 1907.

Many of you have doubtless been at sea and passed a ship at a distance, the wind on her quarter, with royals, topgallant sails, topsails, courses, staysails, jibs and spanker set, every yard and brace singing in the wind, everything drawing, a most beautiful sight; and have turned to look at your own barque; with chafing gear on backstay and shroud, the bulwarks covered with grime, the forecastle in a smother, the sides rusty from a long voyage, not able to realize that the beautiful pictured ship but three or four miles away is in the same condition as the one upon which you are so moodily passing the time.

Emerson says, "Every ship is romantic except the one upon which you are embarked", and so it is with the system of delivery and of determining the differences between the grades in the other markets than our own; they all look perfect from a distance, but those who have to use them complain just as bitterly as we do at home.

The continental spinners and Bremen merchant hedging his cotton in Liverpool, is never satisfied. The Liverpool merchant finds his own method causing him loss and would change for the New York method if he could persuade others of the correctness of his view, and the shipper rebels at having to pay enormous arbitrage awards on cotton when he has been unable to find the grade. I know of one arbitration this year in Liverpool where the shipper paid £4,000 sterling on a lot of 900 bales.

As I stated, the German merchant hedges in Liverpool and

Digitized by Google

New York, the continental spinner and Egyptian merchant in Liverpool, and in turn they all trade heavily in New York, turning their hedges back and forth seeking a profit. Nor is this method alone confined to the cotton trade; in Antwerp is to be found the future market for the woolen trade with warehouses over Germany, France and Belgium which has assumed the position once held by the auction marts in London.

Our market is usually described as not a cotton market, it is well to note that last season we sold more spot cotton to exporters and spinners than any market except New Orleans, Savannah, Houston and Memphis. We sold 226,000 bales and this statement does not include the amount delivered on contract which had first to be sold in order to be delivered. We sell more cotton in small crop seasons than in large, for strangely enough we are apt to draw a larger stock on small crops than on large ones. The reason we do not have a large stock of cotton in New York as in Liverpool is due to the different geographical distribution of the mills and to the policy the mills have always pursued of buying their stock or nearly all of their stock directly from the South, but a large quantity of the cotton is held in your different mill towns by our members.

We have become the great clearing house of the world, our transactions represent cotton in Bombay and Alexandria as well as in Bremen, Liverpool and the South. There is one firm today who holds 60,000 bales of October in New York as a hedge against the sales of yarns and cloths made by Russian mills to the buyers from the interior of Asia. When that is sold it will count for 120,000 bales in the transactions and yet it is doubtful if any large amount of cotton is tendered to them. It is the highest development of commerce that such a clearing house exists and that these contracts are carried out to the letter. Would not the members of this Association be delighted if they could feel certain that none of their forward contracts for 1908 would not be cancelled?

We, however, are seldom looked upon as merchants, a class of men in the spinners mind who only distribute the product of

Digitized by Google

their mills, while those who concentrate and forward the raw material are regarded as either speculators or gamblers, somewhat on the same idea as in the last meeting of the Cotton Growers Association at Birmingham, the statement was made that the "planters had been robbed for the last forty years by the spinner" a description of your vocation certainly not appropriate.

Acting as we do as the cotton clearing house of the world we welcome transactions of every character, believing with the Supreme Court of the United States in the language of Mr. Justice OLIVER W. HOLMES, late Chief Justice of the Commonwealth of Massachusetts; that "in a modern market, contracts are not confined to sales for immediate delivery. People will endeavor to forecast the future and make agreements according to their prophecy. Speculation of this kind, by competent men, is the self-adjustment of society to the probable. Its value is well-known as a means of avoiding or mitigating catastrophies, equalizing prices and providing for periods of want. It is true that the success of the strong induces imitation by the weak, and that incompetent persons bring themselves to ruin by undertaking to speculate in their turn. But legislatures and courts generally have recognized that the natural evolutions of a complex society are to be touched only with a very cautious hand, and that such coarse attempts at a remedy for the waste incident to every social function as a simple prohibition and laws to stop its being, are harmful and vain."

Whether it be a manufacturer in Russia, Germany, Italy or England who, having contracted for the delivery of goods, hastens to hedge by buying contracts in New York, whether it be a merchant who has contracted to supply the spinners with the quality and quantity of cotton he requires, whether it be the planter who is satisfied with the price he may obtain with certainty for his crop, or whether it be the merchant, manufacturer or banker who believes cotton to be cheap and wishes to buy; or high and wishes to sell; we welcome them all to a market where every effort is made to place them upon an equal and fair footing each with the other.

Without the spirit of adventure supported by the merchants

Digitized by Google

of London and Amsterdam, Virginia would not have been settled or New York established and the annals of the Plymouth Colony bear witness of the obligations that struggling body of pilgrims were under to the merchants of London.

We see that the spirit of speculation moves the world today as it did in the early days of our history and it will continue in every commodity as long as time lasts and men seek profitable remuneration by the wear and tear of their brain.

The cotton merchants of New York are a most conservative body of men, they have passed through many difficult situations to emerge from them all holding a higher reputation for fair dealing with each successive crisis. They have maintained and increased their dominant position in the world's markets by the offering to the cotton trade the same standard of classification since 1886 from which the other markets have departed, an accurate compilation of statistics in use by the Department of Commerce, (excepting the stock in Boston which they cannot obtain) and above all the only system in existence which guarantees the grade of the cotton received on their contracts.

They make mistakes as do all, but they are the honest mistakes of a majority which must govern, if we are to have government at all, whether in trade or in the state.

We have tried every known system of grading and delivery and valuing cotton until we have evolved the system we now use which guarantees the grade, enables the buyer to resell and retender without loss in the classification; enables the planter or shipper to tender merchantable grades without change in the differences; publishes to the world the exact grade of the cotton in our stock and places the determination of the value of our contract, not in the hands of any committee with the power to change it many times a year, but in the hands of the entire cotton trade in America, Europe, Egypt and India who register by the price they pay for the cotton shipped to us by the South for delivery, what they believe it to be worth; advantages not offered by any other similar institution in the world in this or any other commodity.

Gentlemen, I thank you.

Digitized by Google

The PRESIDENT. This is a clear statement of the position of the New York Cotton Exchange. I think you will agree with me that the New York cotton contract is not an easy problem to understand. There is an excellent opportunity now to learn more about it by asking Mr. HUBBARD questions.

The SECRETARY. The General Electric Company have telephoned to me wishing to know the number to provide for at the lunch tomorrow. After the adjournment tomorrow the members are going out in front of the Public Library to take special electric cars for Lynn, and there they will have the opportunity, which has never been given before, to see the manufacture of electric generators, and then a lunch will be served by the company at the works. Will those gentlemen who are going kindly raise their hands?

Mr. SIDNEY B. PAINE. Mr. PRESIDENT, before the discussion of the subject of the last paper may I say something further about what is to be seen at the Lynn factory? In addition to going through the covering shop and the foundry and the small motor factory, we shall go into the new concrete building which has just been erected, and in that building the lunch will be served, and in that same building we hope to be able to show you some textile machines in practical operation with individual motors. May I further state that we shall be very glad to see the members of the press or any of your friends who are not provided with the badges — the pins — and if they will see me tomorrow morning I shall be very glad to give them tickets which will take the place of the badges if they are not provided with those badges at the time. There will be three cars at least, and possibly four, so that these badges and pins must be presented. May I suggest that you keep your tickets — of course you will keep your badges, but please keep the tickets until the return trip, because that is the only means of identifying you on the car if you have not a badge.

The PRESIDENT. We appreciate very much, I am sure, what

Digitized by Google

the General Electric Company is doing for us on this occasion. We will have opportunity later to make more formal expression of our feelings in the matter.

To go on with the business, is there any discussion on the subject of the last paper? If not, we will hear the next paper, on The Tariff on Cotton Goods. In connection with the tariff on cotton goods we are to learn something about the changes that have been made in the classification of cotton goods by decisions of the general appraisers and the courts in recent years. We are to hear from Mr. HARTSHORN, until recently an assistant appraiser in charge of the classing of all cotton goods at the port of New York, amounting to — how many million dollars worth of goods, Mr. HARTSHORN?

Mr. EDWIN A. HARTSHORN. About $65,000,000.

The PRESIDENT. Sixty-five million dollars worth of goods have passed annually through the department of which Mr. HARTSHORN had charge. I have pleasure in calling upon EDWIN A. HARTSHORN, Esq., of New York.

Digitized by Google

THE TARIFF ON COTTON GOODS.

EDWIN A. HARTSHORN, 52 Leonard St., New York City.

The Dingley tariff, as enacted in 1897, if paralleled with itself as now interpreted, would make a very interesting exhibit. At the present rate of progress it would not be a difficult mathematical problem to determine the exact date when absolutely nothing will be coming to the government under its provisions.

The avowed object of the law was "to provide revenue for the government and to encourage the industries of the United States"; but the ingenuity in methods, and versatility in thought, by which the government has been deprived of its revenue and American industry of its heritage, would deserve unbounded admiration if directed toward a just or beneficent object.

As a matter of course the importer contends for a construction of the law most favorable to himself, while the custom officials contend for an equitable interpretation, and thus arises an immediate controversy.

The local appraiser fixes values upon imports which may be changed by a general appraiser, whose action may in turn be reviewed by a board of three general appraisers.

Questions of value cannot be carried to the courts, and therefore appraising officers are alone responsible for undervaluations; but the importer who is detected in undervaluation suffers severely, as the law imposes a penalty of one per cent. for every one per cent. of undervaluation. An undervaluation of fifty per cent. thus virtually seizes the merchandise, and results in a total loss to the importer.

Undervaluation deprives the government of revenue, but does not change the tariff law.

Digitized by Google

Upon the advice of the local appraiser, the collector of customs fixes the rate of duty on all imported merchandise. A change of rate not only deprives the government of revenue already collected, but prevents its collection in the future, and thereby rewrites the tariff.

The rate of duty fixed by a collector may be changed by a board of general appraisers; the rate fixed by this board may be changed by the United States Circuit Court; decisions of the Circuit Court may be reversed by the Circuit Court of Appeals, whose action may be finally reviewed by the United States Supreme Court at Washington.

THE GOVERNMENT AS A LITIGANT.

Under such administration of law, both the importer and the government ought to get a "square deal"; but the government as a litigant is not generally a howling success. In every contest it is deaf, dumb, blind, and invisible. Its attorney cannot turn to his client for information or consultation, and consequently many cases are lost which an ordinary litigant would win "hands down".

In a customs case, one attorney for the government appears before the board of general appraisers, another before the Circuit Courts, and still another before the Supreme Court, while the same attorneys handle a case for the importers from start to finish.

The attorneys for the government are paid a meagre salary, while the attorney for the importer usually retains one-half the money recovered from the government; and inasmuch as a single decision may cause the refunding of a vast sum of money, the customs attorney fares sumptuously every day, while the attorney for the government has a constant struggle to keep the wolf from the door.

In producing evidence the government is very seriously handicapped. Much information reaches customs officials from anonymous sources, and also from importers or domestic manufacturers who cannot afford to testify in customs cases. Gov-

Digitized by Google

ernment officials are comparatively helpless if unable through lack of such assistance to produce legal evidence in support of their contentions.

Again the government is most seriously handicapped by its own magnanimity. Importers are permitted to sue the government on frivolous pretexts, without depositing a single penny for the cost of litigation. If the importers were obliged to deposit five or ten dollars with each protest,— the same to be returned if the case be won, but to be retained by the government if the suit be unsuccessful,— not one protest would perhaps be made, where ten or twenty are made under the system now prevailing.

FABRICS AND ARTICLES.

Inasmuch as the cotton and flax schedules of the tariff are very closely connected, and the flax schedule was first attacked, a brief reference to the flax schedule is in order.

Certain compound duties are levied by the present tariff upon woven fabrics made of flax, or articles made therefrom, weighing four and one-half ounces or more, per square yard; but the law provides that none of the articles shall pay a less duty than fifty per cent. ad valorem.

In the self same paragraph a duty of thirty-five per cent. is imposed on "woven fabrics" weighing less than four and one-half ounces per square yard.

Woven articles weighing less than four and one-half ounces per square yard not being otherwise provided for, were dutiable under the "catch-all" paragraph of the flax schedule at forty-five per cent. ad valorem.

After a long contest over the meaning of the law, the United States Circuit Court decided that the words "fabrics" and "articles" as used in that particular paragraph, are interchangeable, and that notwithstanding the omission of the word "articles" in fixing the thirty-five per cent. duty upon fine flax fabrics (cloth), the law fixed thirty-five per cent. duty upon fine flax articles also.

Digitized by Google

The sole purpose of placing a higher rate of duty upon coarse flax fabrics than upon fine was "to encourage the industries of the United States". The coarser goods were being made here to a limited extent, and the finer (such as shirting linens) were not and could not be until the manufacture of the coarser kinds was well established; and therefore a duty for protection was placed upon the coarser, and a duty for revenue upon finer goods.

As the law was enacted, a higher duty was placed upon "fabrics" and "articles" than upon the yarn from which they were woven; and under the protective provision of the law more than seven hundred looms were started upon flax fabrics and articles in a single New England cotton mill. Other cotton corporations having looms available were turning to flax and union fabrics and articles, and would have secured the first advantage to follow from the Dingley Tariff. New linen mills were established in different sections of the country, and still others were in process of erection; but when the courts rewrote the tariff law, fixing a lower rate of duty upon flax articles than upon the yarns from which they were woven, the hope of establishing a greater linen industry in the United States vanished like a mirage in the desert.

If the virus of the "fabrics and articles" decision could have been confined to the flax schedule alone, its effect would have been less disastrous; but its principle of interpretation was soon applied to the cotton schedule as well; since which time nearly all completed cotton articles, not specifically mentioned in the tariff, have been returned for duty as countable cotton cloth, at twenty-five to forty per cent., rather than as "manufactures of cotton not specially provided for," at forty-five per cent.

HOW THE WORK WAS DONE.

Soon after the enactment of the law, certain cotton cloth woven in patterns and cut in lengths, known commercially as "portieres and table-covers," — though not ready for use, — was returned for duty as manufactures of cotton.

Digitized by Google

MOLLETON, OR WOVEN FELT, DUTIABLE UNDER THE LAW AS ENACTED AT 25 PER CENT.; MADE DUTIABLE BY DECISION OF GENERAL APPRAISERS AT 2¾ PER CENT.

This classification was sustained by the Board of General Appraisers, but reversed by the Circuit Court.

Absolutely nothing had been done to the cloth except to cut or subdivide it into shorter pieces, and the law itself defines the term "cotton cloth" or "cloth," wherever used in the cotton schedule, as including all woven fabrics in the piece or otherwise, unless specifically provided for elsewhere. But on the basis of this decision, a whipped blanket with rounded corners was found to be cotton cloth; and thereafter all completed articles not specially mentioned in the tariff, whether hemmed, bound, fringed, or otherwise elaborately ornamented, were found to be cotton cloth. And from that time to the present, "manufactures of cotton not specially provided for" have been as scarce as the proverbial hen's teeth.

Digitized by Google

This interpretation of the law was made notwithstanding the fact that the cotton schedule imposes upon cotton velvet articles, a duty of ten per cent. additional to that upon the cloth from which the articles have been cut; and a similar interpretation fixed an insignificant rate of duty — less than three per centum, — upon certain fabrics in the piece, theretofore returned at forty-five per centum ad valorem.

ETAMINES.

The Dingley tariff imposes sixty per cent. duty upon etamines, but after nearly ten years of conflict it is not yet judicially determined what etamines are.

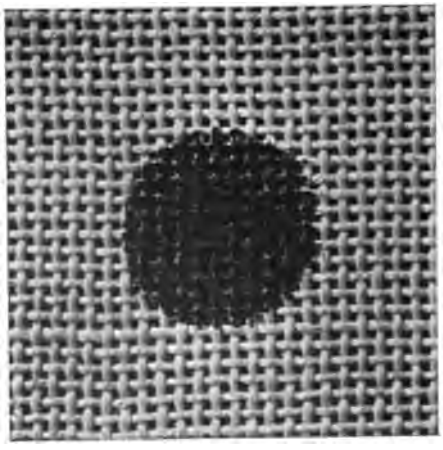
Certain cloth, open-woven with hard twisted threads, used for ladies' dresses, window curtains, embroidery foundations, filtering, straining, and other purposes, has been known commercially for a generation as "Etamine," "Scrim," "Congress Canvas," "Camilla Canvas," and other names; but only the word "Etamines" is mentioned in the tariff law.

ETAMINE, SHOWING CORDS, STRANDS AND SINGLE THREADS.

Digitized by Google

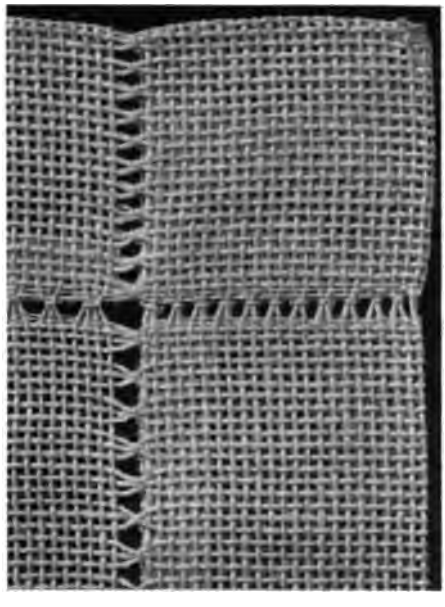
In spite of the fact that nearly all French commercial terms are descriptive as well as denominative, the Board of General Appraisers decided that "Etamines," as used in the tariff, is denominative and not descriptive; and also that certain cotton cloth was known commercially as etamine, at and prior to, the date of enactment of the present tariff.

It was further held that such cloth, if white or ecru, is etamine dutiable at sixty per cent.; that fabrics of exactly the same construction, if to be used for embroidery purposes, are etamine, but, if to be used for ladies' dresses or window curtains, are cotton dress goods, or cotton curtain goods, but not etamine. Further, that the same cloth, if plain woven, is etamine; but if fancy-woven into squares or other drawn work, it is cotton cloth dutiable at twenty-five per cent. Finally, that etamines, dutiable in the piece at sixty per cent., if made into window curtains, bed sets, bureau scarfs, stand covers, tidies, and other completed articles, — hemmed, bound, fringed, or otherwise elaborately ornamented, — are cotton cloth dutiable at twenty-five per cent.



ETAMINE, COLORED AND UNCOLORED. THE UNCOLORED IS DUTIABLE AS "ETAMINE" AT 60 PER CENT. THE COLORED IS BY DECISION OF GENERAL APPRAISERS MADE DUTIABLE AS "DRESS GOODS" AT 30 PER CENT.

Digitized by Google



A Corner of Etamine "Article," Dutiable at 25 per cent., and made from Etamine Dutiable at 60 per cent.

This rewriting of the tariff, by which the government was relieved of a large amount of revenue already collected and preventing from collecting its dues in the future, was not accomplished at one stroke.

The first decision of the General Appraisers cut out all flax etamines and changed the duty upon curtains and curtain cloths from sixty per cent. to an average of less than thirty-five per cent. Another decision removed the etamine duty of sixty per cent. from etamine dress goods and completed articles made of etamine, leaving only an insignificant class of etamines, designed for embroidery foundations, dutiable at sixty per cent.

Thankful that something had been left dutiable as etamines at sixty per cent., the government acquiesced in the decisions;

Digitized by Google

but the importers, aggrieved that anything whatever had been found to be etamines, carried the case to the Circuit Court, where it is still pending.

In the trial of these cases before the General Appraisers, several reputable witnesses testified that they had manufactured, or bought and sold etamines for many years; while other witnesses solemnly swore that they had bought and sold the same merchandise during the same period of time, and had never heard of the word etamine until the appraiser began returning the merchandise as such.

FIGURED COTTONS, OR PARAGRAPH "313."

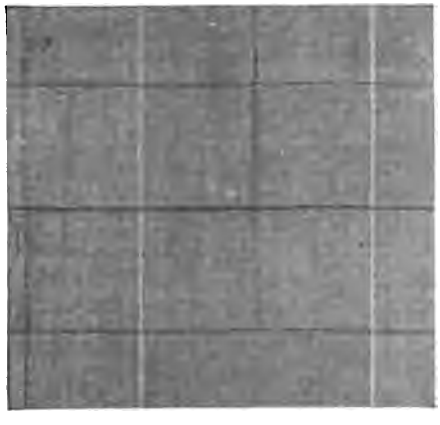
The present tariff imposes an additional duty upon cotton cloth containing other than the ordinary warp and filling threads introduced in the process of weaving to form figures, whether known as lappets or otherwise.

The importers contended that there were no such threads in figured cotton cloth, and protested against the payment of additional duty therefor. In this contention the importers were beaten before the board of General Appraisers and in the Circuit Court, beyond which they did not carry their contention.

Soon after their failure to obliterate paragraph 313 from the tariff, the importers again protested against the additional duty therein provided and this time upon an entirely different ground, frankly admitting that there are other than ordinary warp and filling threads in figured cottons, but maintained that the additional duty provided for in the law could be added only to the specific duties, provided for plain woven "cloth of the same description or condition, weight and count of threads to the square inch," on the plea that the words "value" or "same value" were not used in describing the figured cloth.

The utter absurdity of this contention will be appreciated by those who know that the introduction of figure threads invariably enhances the value of cotton cloth, so that the original fabric could not possibly have the same value after the introduction

Digitized by Google



No. 1, Plain Weave, Valued at 26 Francs for 30 Yards, and Paying Duty of 8.78 Cents per Yard.

No. 2, Fancy Woven Cloth, Valued at 92 Francs for 30 Yards, Which, Under Decision of Lower Courts, Would be Dutiable at 7.95 Cents per Yard, but by Decision of U. S. Supreme Court is made Dutiable at 23.15 Cents per Yard.

Digitized by Google

of such threads; and further that, by reason of the additional cost of introducing figure threads, it would be the height of folly to introduce them, unless the value of the fabric were to be materially advanced thereby. It is difficult therefore to see how the words "same value" could have been written in the tariff at the place suggested by those who consider these words essential to a correct understanding of the law.

For a test case the importers selected an invoice which would be subject to nearly the same duty, whether the specific or the ad valorem rate "elsewhere provided for" were taken as the basis for the additional duty; but the government produced illustrative samples from other importations, which, under the proposed rewriting of the tariff, would pay a less duty if figured, than if plain woven.

The introduction of these illustrative exhibits was objected to by the attorney for the importers, and the general appraiser conducting the hearing for the board sustained the objection. At a subsequent hearing before the full board, the illustrative samples were admitted, and the case decided against the importers. They carried the case to the Circuit Court which decided in their favor, whereupon the government carried the matter to the Circuit Court of Appeals, which sustained the lower court. Fortunately for the government and the industries of the United States, the Supreme Court consented to review the case, reversed the decision of the lower courts, sustained the government's contention, prevented the attempted rewriting of the tariff, and incidentally retained a very large amount of revenue already paid into the national treasury.

The controversy over paragraph 313 covered a period of seven years.

In the first suits the importers denied the existence of threads other than the ordinary warp and filling. In the last, they insisted that such threads were nearly as numerous as stars in the firmanent. In the first contention they claimed that no additional duty could be added. In the last, they maintained that additional duty should be added, but that, when so added,

Digitized by Google

the total duty should be less than the duty to which the additional duty was to be added. In the first suits the importers introduced many illustrative exhibits, some of which were puzzle samples woven in Europe; in the last suit they objected to one or two small illustrative exhibits offered by the government.

The illustrative exhibits introduced by the importers were preserved, while those offered by the government, at first ruled out by a general appraiser and finally admitted by the full board, vanished from the records of the case.

The "fancy cotton controversy" in the entirety, is a reminder of the fellow who, when sued by his neighbor for damaging a borrowed kettle, solemnly swore that he never borrowed the kettle, that it was cracked when he borrowed it, and sound when he returned it.

COTTON BY SIMILITUDE.

To illustrate the extent to which a controversy may be carried and the tariff thereby rewritten, Imitation Silk Yarn may be referred to.

The first rate under which this merchandise was returned for duty was sixty-five cents per pound and twenty-five per cent. ad valorem (equivalent to about fifty per cent).

The importers protested against this rate, claiming that the yarn resembled silk yarn, and that not being mentioned in the tariff law, it was dutiable under the similitude clause as silk yarn at thirty per cent., a contention in which the importers were sustained.

The importers next protested against the rate of their own selection, claiming a closer resemblance to cotton than to silk yarn, in which contention they were beaten before the board of general appraisers. They carried the case to the Circuit Court where they were again defeated, and then to the Circuit Court of Appeals where they were sustained, having secured as they supposed, a rate of about four and a half per cent. ad valorem.

But while the importers may have been celebrating their victory and deliberating whether next to put the yarn into the free list, or to demand a bounty for its importation, it was discovered

Digitized by Google

in the cotton division, that this problematic merchandise was composed of sixteen to twenty-two single strands grouped or twisted together, and that instead of being dutiable as number thirty-fives, it was dutiable under the cotton schedule as number six hundred and fifties at $2.00 per pound, equivalent to one hundred and twenty-five per cent. ad valorem.

The importers having jumped out of the frying pan into the fire, petitioned for another rewriting of the tariff law from one hundred and twenty per cent. back to thirty per cent. which petition was granted by the government and the long contest was terminated.

MARKET VALUES.

Conflicts over market values are of frequent occurrence, and an hour could be consumed in describing various methods by which unscrupulous importers endeavor to enter merchandise below its correct market value. The conviction seems to

IMITATION SILK YARN. — First Rate 50 per cent; Second Rate 30 per cent; Third Rate Intended 5 per cent; Third Rate Secured 120 per cent; Fourth Rate Back to 30 per cent.

Digitized by Google

be prevalent that there is no wrong in defrauding the government of customs revenue; and it is only by the closest scrutiny, and frequently by the merest accident, that customs officials discover the skillfully planned evasions of duties.

I am credibly informed that an American importer recently visited a foreign manufacturer with whom he had not previously dealt, and after placing an order, was boldly asked for the prices at which he desired the goods invoiced for customs purposes. He answered, "At the purchase price, of course," and was promptly informed that none of the American customers of the house had goods invoiced in that way. "Well," said the American, "that's the only way you can invoice goods to me." "All right" replied the salesman, "we will see what can be done." On arrival at a certain city a few days later, the American found a letter awaiting him, requesting a cancellation of the order, for the reason that the American consul, after having seen the invoice, would refuse to legalize the concern's other invoices, and in that event the house would lose all its American trade. The order was cancelled.

Another adroit method of undervaluation is by the purchase and sale of foreign merchandise at prices "delivered in the United States, duty free". This involves the consignment of the goods to an agent in the United States, who then delivers them to the purchaser. The "system" necessitates two invoices for the selfsame merchandise; one for customs purposes, made out in the currency of the country of origin at any convenient price; and another in United States currency for the purchaser, at the purchase price. The foreign vendor appears before the American consul, presents the false invoice and declares "the said invoice contains the actual market value or wholesale price of the said merchandise, . . . and that no different invoice of the merchandise mentioned in the said invoice has been, or will be furnished to any one." Both invoices are then forwarded to the American agent, who appears before the collector of customs at the port of entry, presents the false invoice, and on oath declares, "I do not know of or believe in the existence of

Digitized by Google

any other invoice of the said goods; . . . that the said invoice and the declaration therein are in all respects true; . . . that the invoice now produced by me exhibits . . . the actual market value or wholesale price . . . of the said merchandise." This procedure being concluded, the agent completes the transaction by delivering the goods together with the true invoice to the American purchaser.

Recently by reason of confidential information received here and investigated abroad, and finally applied by the customs officials, an advance of more than 40 per cent. was immediately established in the declared, entered and appraised value of certain merchandise sent to the United States from a single consular district.

This advance was made at a time when there was no advance whatever in the real market value of the merchandise. Prior to this time, the declared, entered, and appraised value of the merchandise referred to was less than six millions of dollars per annum; thereafter the value of practically the same quality and quantity of similar merchandise from the same consular district exceeded nine millions of dollars per annum. The rate of duty being sixty per cent. and the increase in dutiable value being more than three millions of dollars, the annual gain in revenue approximated two millions of dollars, and the total gain has already approximated fourteen millions.

The story in detail of this particular conflict over market values would be interesting, but it is long for this occasion. The most charming part of the story, however, may be mentioned — after the former "go as you please" method of invoicing was discontinued, the importers, realizing that all were now to be upon an absolute equality and fair profits assured in the future, were as well pleased to pay the additional duty as the government was to receive it.

The PRESIDENT. Mr. W. C. MOORE, of Greenville, S. C., has asked the privilege of addressing the meeting for five minutes. He leaves for New York tonight, and it will be necessary to hear him now.

Digitized by Google

Mr. W. C. MOORE. Mr. President — gentlemen: I want to present the cotton question to you from the side of the Southern farmer. I am a Southern farmer myself; I plant cotton and grow it, and have cultivated it with my own hands. I am perfectly well aware of the fact that it has become a custom to look to the channels of New York for your prices. I want to state to you plainly that you have another condition growing up to contend with, and a source that is going to be a feature of your manufacturing profits — that is, the Southern planter is going to have some say-so in making prices hereafter. He has had some say-so this year, if you will compare the prices you paid for the lint with the prices of your futures as quoted by your exchanges.

I am sorry that I am intruding on you in such a way that I have only five minutes to present these facts, because the cotton part of your business certainly amounts to more than five minutes of the life work of you spinners, but I want to get in touch with every New England manufacturer on behalf of the Southern planter. We want to sell you your cotton stock direct from the warehouses in the South. We are preparing warehouses in which to store cotton, — standard warehouses. We can sell you cotton and guarantee you grades. We do not regard New York grades as the best in the world; we think the Liverpool system is the best; we think it is the fairest to both men. Arbitration is the only standard which should settle a grade. We can give you any cotton you want. We can give it to you at the selling price of the planter at the warehouse, with the cost of freight and a legitimate brokerage added, with no speculative futures in it. That is what we want to obliterate. Now, we come to you and ask you to co-operate with us. We are perfectly aware that we shall incur enmity and strife on the part of our cotton merchants, except those who may be connected with this channel of business which you select, and we are going to leave it to you to select your brokers, — we don't care who they are as long as they are honest men and will give us our grades, — and we will give you fair weights and fair grades on our part. That is all there is.

Digitized by Google

It is common to say, "Oh, you haven't the capital to back up this thing." We have the cotton. Now, the proposition of capital is on the other side. It is for the manufacturer to furnish the capital to pay for the cotton, and that is what you do. The cotton merchant does not furnish the capital; he is the dealer between; he is the skimmer and he skims the profits considerably. I was told by a dealer today that he made seventy-five cents to a dollar a bale. We think we can give it to you at a brokerage of twenty-five cents. We are willing to take your own mill treasurers as your brokers if you wish. We will ship the cotton from anywhere in the South, Texas to South Carolina.

We have a membership of a million members. I am aware that popular associations have not always meant much, but this is one that has meant a good deal the last season and which will mean something in the coming season. We have fixed a price of eleven cents minimum. While that was not maintained absolutely last season, it was maintained so closely that men have refused to sell at 8½ cents. I have known men making deals at a loss of two cents a pound. I wonder who brought about that condition of things. It was not the speculator in futures, because he had no interest in that proposition. It was the sturdy farmer, who has only a few bales. You could not break him if you were to make him sell it at eight cents, but he has rebelled at low prices — he has a right to rebel because conditions have changed; it costs him more to make cotton. He asks simply a legitimate living; he does not ask any more of you. We regard the New England mills as a right and a part of our Association, in a certain sense. That is, they are the American interests, to make the foreign market high enough to pay us just a fair price. You want your margin in manufacture. It is immaterial to you, as I understand it and I have had it explained to me, whether you pay twelve cents for your raw cotton or buy it at eleven cents, providing your selling prices are satisfactory. You are obliged to make your contract from the cost of your raw material. What we want and what we are striving for is a uniform price. Who ever heard of a crop of

Digitized by Google

cotton being worth one day twelve cents and six days later eleven cents a pound? That is a condition of speculation. There is no sense in it, there is no logical reason in it, except in the interests of individuals to press the market one way and the other and it is a fact conceded by everybody that New York has practised that to an extent this year that has almost ruined the Southern cotton buyers. They certainly have lost a great deal of money, so have the exporters but the spinner has had a fortunate position this year; he has been able to sell at very satisfactory prices, and if you people are making the money the South is making in its mills you certainly should be happy. What we want is to place the cotton to you with the least possible cost. We have our arrangements in the South where we get the cotton. There is no question about that; we have the cotton in hand; we have it in our warehouses; we want to ship it to your mill direct. You can place any kind of a reasonable condition over that shipment you want and we will comply with it providing it is a fair condition. We will ship you cotton and allow you to deduct $5 a bale to hold yourself safe on your payments, if you wish, or we will bank it with what banks we have at the South. We are regarded as financially helpless but if you will notice the deposits the Southern farmers have a considerable amount in the local banks in the towns and cities and when you get it all together it amounts to enough to begin to take care of cotton. It is true the Southern farmer has been very, very poor and he is very poor yet but he is fast getting out of that state and with it comes a spirit of independence and of rebellion against conditions that he knows have been unfair to him. He does not lay the blame to the manufacturer but he lays it to the dealer between and whenever there is any friendship offered between the two, it must be regarded as somewhat deceptive, because it is a fact that the planter does not regard the cotton buyer as his friend. He has only allowed these conditions to grow by neglect and it is thought that he is in a position now to take advantage of that condition. Now, I want to get into communication with every man in New England who is interested in this question of buying his crop direct.

Digitized by Google

The PRESIDENT. The American Asiatic Association has been doing important work in regard to trade relations with countries in Asia especially with reference to the political influences affecting our trade with these countries. We have with us the Secretary of this Association, Mr. JOHN FOORD of New York City. [Applause.]

Digitized by Google

AMERICAN COTTON TEXTILES IN THE FAR EAST.

JOHN FOORD, 32 Broadway, New York City.

It is easy to exaggerate the possibilities of the expansion of our trade in cotton textiles in Asia. It sounds sufficiently impressive to be told that in cotton goods alone the value of the imports of the Oriental people amount to $300,000,000 annually, and it sounds like a reproach to say that the share which we are supplying of this is almost infinitesimal, except in northern China. As a matter of fact, in the year that these people bought $300,000,000 worth of foreign cotton goods, the American contribution to the total was only $37,300,000. As of this amount $33,500,000 represented the value of our sales to China, our contribution to the Oriental trade outside of China was a very small fraction indeed. That is to say, China bought in that year foreign cotton manufactures to the value of $128,500,000, of which the United States supplied a little less than 16 per cent., while the other countries, roughly classed as "Oriental" took $171,500,000 worth of similar goods of which the share of the United States was less than 2½ per cent. These so-called Oriental countries comprise not only the nations of Asia but some of the communities of northern Africa and of Oceanica in addition, and include half the population of the globe.

I am not disposed to regard these figures as symptomatic of our failure in the markets of the Orient. Strictly speaking, the possibilities of these and other markets for our cotton textiles are very much what we choose to make them. It seems like a reflection on American energy and enterprise to point out that

Digitized by Google

while we produce three-fourths of the world's cotton, we permit two-thirds of it to pass out of the country in its natural state to be elsewhere transformed into cotton goods, of which the total value entering international commerce amounts to nearly $700,000,000 annually. But it must be assumed that a perfectly simple explanation of this is to be found in the conditions governing the employment of our capital and labor. At a time when there is a deficiency of productive power to supply the needs of the home market, some other word than "failure" must be employed to describe the paucity of our contributions of manufactured goods to foreign markets.

For the purposes of our present discussion, it is at least permissible to regard the success with which during the last twelve years we have found a steady increase of purchasers for American cotton piece goods in Asiatic markets as fairly indicative of what may be accomplished in the immediate future. The sum of our exports of manufactured cottons attained its maximum in 1905, using the figures of the calendar year as lending themselves more readily to comparison. The recession of values since that time tends to modify the significance of the figures of 1905, but they stand at least as the high water mark of this branch of our export trade.

The exports of all kinds of cotton manufactures of domestic origin in 1905 were valued at $56,461,000, of which $34,022,358 or 60 per cent. was taken by China and Hongkong. Ten years before, in 1895, the total value of the exports of manufactured cottons was $13,226,277, of which China and Hongkong took $2,775,000 or 21 per cent.

When Lord CHARLES BERESFORD investigated the imports of cotton piece goods into China during his visit in 1898, he found the following state of facts: in the ten years between 1887 and 1897 the United States had increased her interests in the importation of plain cotton goods into China by 121 per cent. in quantity and 59½ per cent. in value, while the interests of Great Britain and India in similar goods had decreased during the same period 13¾ per cent. in quantity and 8 per cent. in

Digitized by Google

value. It was his conviction that this competition of America with Lancashire and India would become keener as time went on. He said that ten years before the date of his visit, America's interest in the piece goods trade with China was confined to her exports of surplus domestic goods — that is, of goods manufactured for home consumption, and which were, for the most part, of too high a standard of quality for general Chinese use.

Though this is not a strictly accurate statement, it is in the returns of 1897 that we shall find the first plain indication of the beginning of serious competition by the American cotton manufacturer for a share of the Chinese market. The quantity of American cotton piece goods exported to China in 1897 was 160,000,000 yards and the value $8,750,000, while for 1905 the figures were 563,000,000 yards valued at $33,514,818. It is quite true that the figures for 1905 indicate an expansion of the trade which was too sudden to be the result of a legitimate demand. But even if the normal growth of this branch of our commerce is to be measured by striking an average of the exports of the three years, 1905-7, it will be found that the proportion of our sales of cotton piece goods to China has more than doubled in ten years.

Special agents of our government have investigated this subject, and have dealt with it in the ingenuous spirit of the new discoverer. But, whatever may be said about the value of their specific recommendations, there can be no question about the soundness of the general conclusion that American gray cotton piece goods control the markets of northern China, not only because of superiority in quality and greater adaptability to the climatic conditions, but for the reason that the Chinese now fully appreciate that they practice real economy in buying pure, unsized cotton goods manufactured without the use of any foreign matter. It is through the realization by the natives of the north that heavily-sized piece goods, weight for weight, are inferior in every respect to the pure article, that the importations of English makes have steadily decreased, while succeeding years show more than a proportionate increase in the demand

Digitized by Google

for American goods. The goods sold themselves after they were properly introduced and firmly established in the market through the untiring efforts and business-like methods of the dealers in American piece goods in Shanghai and the surrounding country.

There was a time when a stoppage of the export demand for American cotton cloths for China would have produced a serious dislocation of the entire cotton textile industry of the country. Whatever may be the possibilities of the future, no such condition exists today. But our immediate independence of an export outlet for surplus production, does not affect the wisdom of a policy looking to the expansion of this trade along the lines of its moral development. I shall not attempt to tell practical men what they might gain by bidding for the trade of central China and of India by the introduction of a new process of manufacture required for the production of sized cottons. It may, or may not be true, as one of the investigators of the Department of Commerce and Labor has claimed, that we can by a process of education show the Chinese the folly of buying sized goods and sticking to the conservative idea of paying for paste instead of pure cotton. It is certain that, up to date, our pure four-yard sheetings that have gone up the Yangtsze, and even penetrated to the West River, have not proved to be the forerunners of an extensive demand.

The beginnings made in the British East Indies are somewhat feeble, but, such as they are, they represent for the current fiscal year an amount twice as large as the exports of 1904. It may be noted that of the exports of cotton piece goods in 1905 which were the product of British looms and were valued at $344,631,000, British Asia absorbed nearly one-half, or, in actual figures the amount of $117,434,000. It is doubtless true that wherever British trade flourishes there is a promising field for American manufacturers, but it would be unreasonable to expect that while the American manufacturer of cotton piece goods finds his most profitable field at home, he can be induced to make very substantial sacrifices for the cultivation of new fields abroad.

Digitized by Google

I imagine, however, that you are all prepared to recognize and act on the very obvious truth that the growing productive energy of your mills will, sooner or later, overtake and exceed the requirements of the domestic demand. It would thus be the height of folly to refuse to make any effort, or any sacrifice, to retain possession of a market which has proved vital to the prosperity of your trade in the past, and which may be found equally indispensable in the near future. There can be no question that the Chinese market is still overstocked with American cottons, though it may be only a question of months before the congestion is finally relieved. The three eastern provinces, known as Manchuria, are an important section of the North Chinese market for American cotton fabrics, and the prospects of material development in that part of the Empire are of the brightest. Population is pouring in from the southern provinces, and the earning capacity of the people is rapidly growing. There would be danger to our trade should northern Manchuria be left to Russian pre-emption as a special sphere of interest, and if the sonthern province should be subjected to a process of pacific assimilation by Japan. But the same vigilance which averted the major disaster of a dismembered China will doubtless be found effective to counteract the minor danger of a partially closed door in Manchuria.

As for the eighteen provinces of China proper, their transformation into communities as progressive and prosperous as they are populous, is destined to be one of the notable achievements of the twentieth century. It is simply impossible to realize what the slightest increase in the capacity of the ordinary Chinaman to consume the simplest necessaries of civilized life may mean for us. When President HILL of the Great Northern railway, was discussing with a Chinese viceroy the possibilities of the Asiatic market for American flour, he asked, "What would happen to your rice culture if you took to buying our breadstuffs?" "If the United States sent to China all the flour it could spare," said the Mandarin, "it would not give to each inhabitant of my province more than half an ounce a day; so do not trouble yourself about our rice culture."

Digitized by Google

"China's trade possibilities are immeasurable," was the verdict of a commission of Lancashire cotton spinners who went through the country in 1898. "Foreign trade has merely scratched the surface of the possibilities of China," was the dictum of the Lyons' commercial mission which traversed China about the same time, and to this was added the remark: "The great majority of the Chinese are familiar neither with foreigners nor with foreign products."

For the present, there is a famine in the land, and rice is inordinately high. But this temporary arrest of the purchasing power of the Chinese millions will pass, and with every new development of the energy which has begun to stir throughout the Empire, will come the elevation of the people to a higher plane of comfort, with a corresponding increase of capacity to consume.

It is manifestly a question of vital importance for the people of this Republic, no less than for the membership of industrial organizations like yours, that our relations should be those of perfect friendship with an Empire comprising at least one-fifth of the human race and but newly entered on the path that leads to wealth and power. The narrow-minded and short-sighted prejudice of a small section of our people which has operated to prevent the maintenance of satisfactory relations between the United States and China must cease to be the potent influence which it is in our domestic politics if we are to have the share of the greatest of unexploited markets to which our geographical position and boundless resources entitle us. The spirit which animated the references to this subject in the President's Message of December, 1905 is, unfortunately, one which Congress has not seen fit to imitate, and there has been no sufficiently imperative popular mandate in regard to our treatment of Chinese entitled to come to this country to enable members of Congress to disregard the clamor that comes from the Pacific coast whenever it is a question of liberalizing our Chinese exclusion legislation. But I am not more sure that trouble will follow the sop which has been thrown to the Japanese and

Digitized by Google

Corean Exclusion League than I am that we must revise in a more enlightened spirit than we have recently manifested, the whole fabric of our legislation and treaties in regard to Chinese immigration, if we are to enjoy equal opportunities with other nations for securing part of the enormous trade which must accompany the new birth of a progressive civilization in the oldest and greatest of Empires.

The PRESIDENT. The next paper is on Sea Island Cotton. I have pleasure in calling upon Col. GEORGE A. GORDON, of Savannah, Ga. [Applause.]

Digitized by Google

SEA ISLAND COTTON.

GEORGE A. GORDON, Savannah, Ga.

It is hardly necessary for me to say that I feel highly complimented at the opportunity accorded me of addressing this honorable and influential Association.

Doubtless many of you wonder why Sea Island cotton should be selected as the subject of an article before the National Association of Cotton Manufacturers. The Sea Island crop constitutes only one-half of one per per cent. of the entire American production. Its value is only about one per cent. of that of the total cotton crop of the United States. Its culture is restricted by soil and climate to a narrow strip of the mainland of Georgia and Florida, and to the islands along the coast of South Carolina. Its marketing and consumption engage the attention of a comparatively small number of people. And yet Sea Island cotton is seldom mentioned without attracting immediate attention. It has been studied and written about until there is practically nothing new to be said on the subject. It has played a part in the creation and in the development of the cotton trade, which is out of all proportion to its quantity and value, and it has had an influence on the history and economic development, not only of the southeastern portion of the United States, but also upon that of the British West India island possessions. It has a vital interest for each one of you, which perhaps you little suspect. Probably every man before me today is indebted to Sea Island cotton for enabling him to maintain a decent and presentable appearance before the world. Your clothes are held together by sewing thread made from Sea Island cotton,

Digitized by Google

and were it in your power at this moment to renounce all dependence upon Sea Island cotton, the stitches would part, your garments would fall from you and the members present would be placed under arrest by the police for indecent exposure.

In dealing with the subject, I shall try to avoid, as far as possible, its more technical features, and to touch lightly upon the salient points in its history; upon its present status and upon its future development.

What, then, is this Sea Island cotton? Whence did it come? How is it produced? Why is it valuable? Where is it spun? Into what products does the yarn go?

The name is a misnomer. Only from eight per cent. to twelve per cent. of the crop is actually produced on islands, the balance being grown on the mainland from seed originally imported from the islands. The cotton is a black-seed, long-stapled cotton. It belongs to the group Gossypium Barbadense, so-called because it was supposed to have been first found in the Barbadoes. It is said to have been indigenous to the West India Islands, a perennial plant growing wild there. The first reference to this West India Sea Island cotton is probably found in a pamphlet published in London in 1666, entitled "A Brief Description of the Province of Carolina, on the Coast of Florida." This pamphlet contained the following:

"In the midst of this fertile province, in the latitude of 34 degrees, there is a colony of English settled, who landed there on the 29th of May, A. D. 1664. They brought with them most sorts of *seeds* and *roots of the Barbadoes*, which thrive in this most temperate clime. They have Indigo, very good tobacco and *cotton wool*."

Another and still more definite reference to long-stapled cotton is probably that of Captain ROMAN, of the British Army, who, while travelling in East Mississippi in 1722, wrote that he found black-seeded cotton growing on the farm of a Mr. KREBS and also a machine invented by Mr. KREBS for separating the lint from the seed.

Digitized by Google

In the year 1733, General JAMES OGLETHORPE sailed from England for the purpose of founding a colony where the oppressed and unfortunate — principally the inmates of the debtor's prisons — might find refuge and begin life anew. Seventeen miles from the mouth of the Savannah river he founded the city of Savannah, and named the infant colony Georgia. The records show that in the following year cotton was being grown in the gardens of the settlers.

In 1741, SEABROOK'S description of St. Simon's Island mentions the fact that the soldiers of General OGLETHORPE'S regiment planted small plots of land near their camp in cotton, which, when gathered, their wives spun and wove into stockings. In 1749, we read that the London Trustees of the Colony of Georgia objected to the colonists spinning and weaving their cotton, because such a custom might interfere with the cotton manufacturers of Great Britain.

This West India cotton, however, bore little resemblance to the present Sea Island product.

The first authentic record of the introduction of Sea Island cotton (as we now know it) was in 1786, when seed was sent from the Bahama Islands to Governor TATTNALL and WILLIAM SPAULDING, and was by them introduced into Georgia. Referring to this seed, it is stated; "The cotton adapted itself to the climate, and every successive year from 1787 saw long-stapled cotton extending itself along the shores of Georgia and South Carolina."

RICHARD LEAKE, of Savannah, was probably the first man to plant Sea Island cotton, and in 1788, sent samples to Philadelphia, mentioning in his letter of advice that he would raise 5,000 pounds of seed cotton on eight acres and also stating that he found great difficulty in cleaning the cotton from the seed.

NICOLL TURNBULL was said to be the first planter who cultivated cotton upon a scale sufficiently extensive for exportation. The cotton was raised on Deptford Plantation, three miles from Savannah.

Digitized by Google

In South Carolina, the first successful variety of Sea Island cotton was raised by WILLIAM ELLIOTT, on Hilton Head, near Beauford, in 1790. He records the fact that he bought 5½ bushels of seed in Charleston, paying for them 14 shillings per bushel and that he sold his crop for 10½ pence per pound.

In 1791, JOHN SCRIVEN, of St. Luke's Parish, planted 30 to 40 acres on St. Mary's River and sold his cotton at from 1s. 2d. to 1s. 6d. per pound.

In 1805, Sea Island cotton sold at 30 cents per pound, while uplands were selling at 22 cents. In 1816, it sold at 47 cents, with uplands at 27 cents. In 1825, Mr. KINSEY BURDEN of South Carolina, sold 60 bales at $1.10 per pound, and another year sold his crop for $1.25 per pound, when the average price of uplands was 9¼ cents.

Thenceforward, the crop steadily increased, keeping pace with the demand from spinners. The planters grew rich and influential. The effort to raise the cotton was confined to the islands and coasts of South Carolina and Georgia. With the use of slave labor, the planters maintained a high degree of cultivation, and by a judicious system of seed selection, gradually improved the quality of the staple until their crops became famous, and were eagerly sought after by the fine spinners of England and France.

The market for the staple was Charleston, and the entire crop was shipped abroad. The planters believed that slavery was essential to the maintenance of the quality of their product, and they opposed with every means in their power the abolition movement. In 1856, a book was published by DAVID CHRISTY, entitled, "Cotton is King," which dealt exhaustively with the relation between slavery and cotton and concluded that the "United States' monopoly of the cotton markets renders slavery impregnable."

In the year 1850, emigrants from Carolina commenced to move into Florida, where the settlers soon discovered that the region known as East Florida was capable of producing a quality of Sea Island cotton similar to the genuine island cotton, though

Digitized by Google

not quite so excellent in staple. They imported seed and shipped their lint cotton to Charleston. Several years later Savannah, the original Sea Island market, began to make a fight to get the business of these Florida planters away from Charleston. They did not succeed in securing the product of the Carolina Islands, but being nearer to the Florida plantations and taking advantage of the extension of railroads into that section, the Savannah merchants commenced to build up a market for the mainland Sea Island product, which attracted the notice of export buyers. Their chief difficulty was their inability to compete with the Charleston factors in the prices obtained for the cotton consigned to them.

About this time Georgia growers of upland cotton who had been in the habit of trading with Savannah began also to emigrate into Florida. By furnishing these planters with money and also by securing and distributing good island seed, Savannah factors introduced a satisfactory and growing business in Sea Island cotton. Then the civil war came and destroyed the commerce of both Savannah and its competitor, Charleston.

At the close of the war, the Savannah merchants worked with energy to retrieve their ruined fortunes and endeavored to re-establish Savannah as a Sea Island market. It was important to convince the planters that good prices could be obtained in Savannah, as well as in Charleston, and in this connection, a curious incident may be narrated:

In 1850, when the first world's fair was in progress at the Crystal Palace in London, Capt. JOHN CORRIE, of the schooner "Wanderer," while viewing the exhibits, noticed a large sign placed over a small saucer containing some black seeds, upon which was inscribed the following notice:

"Cotton Raised from these Seeds was Spun into a Thread 150 Miles Long."

Being fond of collecting souvenirs, Capt. CORRIE proceeded to help himself to a handful of the seed, but was told by an attendant that they were very precious and were not to be disturbed.

Digitized by Google

He, therefore, released the bulk of the seed, but retained in the rough palm of his hand five seed, which he transferred to the pocket of his vest. Nine years later, when the "Wanderer," brought to Jekyl Island the last cargo of slaves which was imported into the United States, Capt. CORRIE noticed that cotton was growing on the island, and he hunted up his old vest and found in the lining of the pocket the five seed which he had taken from the Crystal Palace exhibit so many years before. He gave these to Mr. JOHN DU BIGNON, who, at that time, planted on Jekyl Island, and mentioned the notice which he had seen in London. Mr. DU BIGNON planted the seeds in his garden and secured enough second year's seed to plant a crop, which the advent of the war, however, prevented him from shipping. During the war the bales were hidden in the Jekyl Island swamp, in order to protect them from seizure by the Union troops. After the war, in 1865, with their bagging nearly rotted off, they were shipped to the firm of Tison & Gordon. These three bales were sold at $1.62½ per pound, which, so far as I am aware, is the highest price obtained for any cotton in the Savannah market during the last half century. The reputation of this sale travelled far and wide and was largely instrumental in persuading the planters of Georgia and Florida to abandon Charleston and ship their cotton to the Savannah market.

Knowing the history of the seed from which these three bales were raised, and realizing fully the importance of seed selection, the above mentioned firm entered into negotiations with one of the best planters on the Carolina Islands, who agreed to produce for them, within three years, any style of cotton seed which they desired. A very satisfactory seed (known as the Gordon A seed) was secured, and was, for years, used by the Florida planters with excellent results. This seed produced fine staple, but was not prolific. The cotton raised from it competed with the lower grades of island cotton.

The invention of the sewing machine worked a revolution in the production of Sea Island cotton. It was found that thread

Digitized by Google

made from upland cotton could not stand the jerk of the sewing machine, and it became necessary to find a substitute. The genuine island cotton was too expensive and yielded too small a quantity for the uses of the trade. In seeking to meet this demand, it was discovered that the level, sandy pine lands of Georgia, (which were not adapted to the A seed used in Florida) would produce a good style of Sea Island cotton of a coarser variety. After some experiments, the Carolina planter succeeded in producing a seed known as "The Gordon C seed," or "Gordon Low Bush" seed, which was very prolific; produced a staple somewhat coarser and shorter than the island cotton; gave a yield of one pound of lint to three of seed on the Georgia lands, and yielded per acre nearly as much as upland cotton. This cotton was found to meet exactly the requirements of the thread men, and as it could be produced cheaply, a large increase in the crop took place.

The effect of the introduction of this cotton upon the Georgia planters was remarkable. In a few years these men rose from a state of extreme poverty to comparative independence.

As the production of Sea Island cotton has increased, new uses for it have been found. Originally, its cost restricted its use to those who spun yarns for the finest laces. Without interfering with this trade, which continues to the present day, the lower grades were found to be suitable for the manufacture of sewing thread, and they became the staple raw material for the thread manufacturers. Sea Island cotton is also used in the manufacture of fishing lines, boot laces, the finest mercerized fabrics, electrical tape, government mail bags, sails for racing yachts, and cloth for bicycle and automobile tires. At first it was spun only in England and in France, but it is now spun all over New England, and even the Southern States are beginning to take a share of the crop.

The increase in the American consumption should prove of interest to the members of this Association. In 1870, only 5 per cent. of the crop was consumed in this country. In 1880, the consumption had risen to 35 per cent. In 1894, although

Digitized by Google

the crop had increased 130 per cent., over 40 per cent. of it was consumed in the United States. Of the crop of 1905–06 (which was the largest on record, 125,000 bales) there was exported only 25 per cent., the remaining 75 per cent. being consumed in the United States.

Technically, Sea Island cotton should be divided into two groups: the fine crop lots grown on the islands near Charleston, S. C., which, even now, command prices ranging from 30 cents to 75 cents per pound, and the remainder of the crop, which is grown on the mainland of Florida and Georgia, the largest market for which is Savannah, Ga.

As has been stated above, Sea Island cotton is a long-stapled, black-seed cotton. It seems to be affected by the sea air, and does not thrive when planted at a great distance from the coast, although cases have been known where it has been advantageously produced 100 miles inland. Experience shows that the quality of the mainland cotton deteriorates unless fresh seed is imported from the islands every third or fourth year. The length of this Georgia and Florida staple averages about 1⅝ to 1¾ inches. The soil best suited for Sea Island cotton is what is known as a sandy loam. Where clay comes too near the surface, the weed grows large but produces little fruit.

The season for planting varies widely in different districts. The planters on the Carolina Islands take far more pains in preparing their land, working it and gathering and marketing their crop than do the farmers of the mainland, but as the latter produce the largest portion of the crop, it may be of interest to describe their method rather than that of the Island planters.

About the first of January, or as soon after as the growth of the previous year is brittle enough to cut, all of the stalks are cut down with roller cutters and plowed under with heavy two-horse plows. The stalks are left to rot until about planting time, which is usually during the latter part of March or the first half of April. The land is run off into rows 4½ to 5 feet apart and the ground is bedded. These beds are then opened and from 300 to 600 pounds to the acre of fertilizers are strewn in the

Digitized by Google

FIGURE 1.—EMERGENCY TRANSPORTATION.

Digitized by Google

rows. The seed is planted immediately afterwards and is covered with about two inches of dirt.

In about three weeks when the cotton is all up, the hoe hands are put into the fields and chop out the rows, leaving one or two stalks to the hill. The best planters leave a distance of from 12 to 18 inches between hills. Throughout the spring and summer and until about the middle of July, the crop is plowed once or twice a month or oftener, according to the amount of rain, in order to loosen the ground and keep the grass and weeds down.

Early in June the plants begin blooming, the flowers being a pale yellow in the morning and fading to red in the afternoon. There are three sets of bolls on each stock which constitute the first, or bottom crop; the second, or middle crop; and the third, or top crop. The staple produced from the three pickings varies greatly, the staple of the top crop being usually much inferior to that of the other crops.

The blossoms stay on the plants from 24 to 48 hours and then drop off, leaving the "form", or "square", which develops into the boll. The first bolls begin to mature about the end of August or first part of September, the three months from June to September inclusive, being considered the most important in the cultivation of Sea Island cotton. Blooms that come after the 10th of September are not expected to mature, as the bolls will probably be caught by the frost.

Rains are particularly damaging to Sea Island cotton, as they cause the stalk to grow too rapidly, and thus shed its leaves and bolls.

Statistics of the rainfall show that it is greatest when the plants are growing, viz.: from May to August; and when the crop is maturing and being picked, from September to November, the rainfall is least.

With the opening of the first bolls, picking commences and continues well on into December, according to the size of the crop and the lateness of the season. The cost of picking, ginning and preparing for market is about twice that of the ordinary Upland cotton, and it has been demonstrated by experience that

Digitized by Google

whenever the market price of Sea Island cotton falls to a figure less than double that of Upland cotton, farmers will plant the latter in place of Sea Island cotton, the lands being equally well adapted to either growth.

FIGURE 2.—PLATT ROLLER GIN.

The cotton is ginned on a roller gin and should be carefully prepared while in the seed before ginning. On the Islands, women are employed to pick the seed cotton free from stains, leaf and immature locks (see accompanying illustration of Waterhouse's gin). It is important also that the cotton be free from dampness when ginned, as otherwise the staple will be crimped and materially injured. On the other hand, it should not be dried to such an extent that the essential oil from the seed will be extracted from the staple, leaving the latter brittle and undesirable.

The gins almost universally used are the McCarthy Single Action, Single Roller Gins, made by Messrs. Platt Brothers, of Lancashire, England. There are, however, many modifications.

Digitized by Google

(Illustrations are given, kindly furnished by the Madison Ginning Company, of Madison, Florida).

The yield and cost of production, the price of picking and the price of ginning vary so widely in different localities that no general statement of these can be given. In some places, the cotton is bought in the seed and ginned at large ginneries; in others it is first ginned, and the seed and lint then bought at specified prices. In certain sections, small gins are scattered throughout the country. At these the farmers have their cotton ginned, and then bring it to market on wagons in order to sell it in the bale.

The seed is used in some of the local oil mills, but a large percentage of it is exported and is crushed abroad in connection with Egyptian seed.

FIGURE 3. — BALE OF SEA ISLAND COTTON IN PRESS, BEFORE COMPRESSION.

Digitized by Google

FIGURE 4. — BALE OF SEA ISLAND COTTON AFTER COMPRESSION.

There are very few large Sea Island plantations. Generally speaking, the cotton is raised on small farms by what are known as "one-horse farmers," who do a large portion of their own farm work. They represent the best class of farmers that the world produces, being conservative, thrifty and men of small but independent means.

The Georgia and Florida cotton is baled in rectangular packages, weighing about 400 lbs. On the islands it is put up in bags weighing about 350 lbs. The bagging used is a close-woven jute, 50 inches wide and weighing 2 lbs. to the yard. The edges are sewed together with hemp twine. When a good quality of bagging is used, it affords satisfactory protection to

Digitized by Google

the cotton, and the packages are received at the mills in much better shape than are the bales of ordinary upland cotton.

Domestic spinners receive their cotton uncompressed, and without any bands. Foreign shipments have first to be compressed (see illustrations).

The characteristics required of Sea Island cotton are, that the staple shall be long, strong, fine, silky and uniform; that the preparation shall be smooth and clean, and free from imperfections and waste.

The Carolina planters have succeeded in producing, in some instances, a staple from 2¼ to 2½ inches long, and the genuine island cotton is spun into counts of yarn ranging from 120's up to 400's. It is claimed that the finest qualities have been spun as high as 2,000's.

RICHARD MARSDEN, in his standard work on "Cotton Spinning," has well said that "Practical skill and high discriminative power are needed in classing to select cotton of the proper quality to make any description of yarn." This is particularly true of Sea Island cotton. As has already been stated, the same stalk produces different qualities of staple at different seasons of the year. In the same locality, owing to differences in the quality of the seed planted, in the amount of fertilizer used and in the richness of the soil, cotton of widely varying value is produced. Furthermore, one spinner may require an entirely different style of cotton from another, length being the prime requisite in one case; strength in another; fineness in another; glossy, clean appearance in another; freedom from waste in another, etc., etc. For these reasons, it has been found impossible to engage successfully in a system of buying cotton at innumerable interior points and shipping it through to the mills without concentration and classification under the direction of an expert. For the same reasons, Sea Islands have never descended to the depth of a future contract business.

One of the most interesting features in connection with the Sea Island trade at the present date is the effort on the part of West India planters to produce upon its native soil the Sea

Digitized by Google

Island cotton which, for more than a century, has been neglected. Uuder the fostering care and intelligent guidance of Sir DANIEL MORRIS, Imperial Commissioner of Agriculture for the West Indies, an enormous amount of information has been acquired and disseminated throughout the islands, and an earnest, practical effort has been made to revive the culture of Sea Island cotton. No small degree of success has already attended these efforts, but unless some means are discovered of successfully combating the insect pests, it is probable that cotton growing in the West Indies will eventually be abandoned.

In spite of the smallness of the crop, it has never been pos sible to corner Sea Island cotton, one reason being that substitutes can nearly always be found, though they are often unsatisfactory. One of these substitutes is Yannovitch, Egyptian cotton. The introduction of this cotton has been a distinct advantage to Sea Island cotton producers. Its widespread consumption has created a demand for goods made from extra-stapled cotton, and caused the installation of machinery which might, otherwise, never have been brought into use. The result

FIGURE 5.—BALES OF SEA ISLAND COTTON BEFORE COMPRESSING.

Digitized by Google

has been that the lower grades of Sea Islands have been favored by spinners of Yannovitch cotton, whenever the two qualities approximated the same price, and this has prevented the former from being unsalable when, in large crop years, the better grades of Sea Islands supplied the demand of the Sea Island spinners. In this connection, it is worthy of note that the Sea Island cotton shows a far greater persistence than any of the long-stapled Egyptian growths. This is an important matter for spinners. They must know that a certain quality and quantity will be produced from year to year, with a reasonable degree of regularity. In spite of irrigation, the production of lint cotton per acre is falling off in Egypt, and nearly all the extra stapled cottons there have gone out of existence. Galini, Ashmouni and similar staples are no longer produced, and it has been predicted that Yannovitch and Mit Afifi will follow the course of all other Egyptian extra-stapled growths, and gradually disappear.

A table is appended showing the production and distribution of the Sea Island crop and the average Savannah price of the average grade of the mainland cotton over a series of years. While it is probable that some of the cotton reported to have been consumed by domestic mills has, of late years, been reshipped to foreign mills, there is no question that the mills of the United States now consume nearly double the amount of Sea Island cotton consumed by the mills of all the rest of the world.

In conclusion, there is one thought which I wish to suggest to cotton manufacturers, and it is this: At present Sea Island cotton is spun by only a very small number of spinners. Yet the spinner who looks to the future and is determined to succeed, is likely to be constantly saying to himself, "Spin finer, and then finer, and yet again finer." In order to do this, however, he must have the proper raw material. Cheap cotton will produce poor yarn; you cannot fool the machinery, and, therefore, it is likely, as time goes on, that an increasing number of you will be seeking Sea Island cotton, and will wish to have a regular,

Digitized by Google

FIGURE 6.—COMPRESSED BALES OF SEA ISLAND COTTON.

abundant, properly classed and reasonably priced supply. To all such I would say that the territory where Sea Island cotton is now raised is capable of producing twice, or even three times the amount of Sea Island cotton now grown. Not one-third of the available land is under cultivation. A year ago the crop reached a total of 125,000 bales, which was the largest on record. This year, owing to reduced acreage. and unfavorable weather, it will not reach 60,000 bales, but, in my opinion, given an abundant supply of labor, a crop of 300,000 or even 500,000 bales weighing 400 lbs. each, could be produced.

There is another feature in this connection which will probably appeal to spinners whose mills are at a distance from the cotton fields. The cost of the raw material is so small an item in the

Digitized by Google

total cost of goods manufactured from Sea Island cotton that transportation charges have very little effect upon the price which a spinner can pay. It therefore follows that the competition of the mills situated in the South, while it may prove injurious to Northern mills which attempt to spin coarse numbers, is not likely to hurt the mills spinning fine numbers.

I trust that all of you will be sufficiently interested to look more closely into the possibilities of Sea Island cotton spinning.

Bibliography: King Cotton, DAVID CHRISTY; New York, 1856.

Cotton from Field to Factory; JOHN MORTIMER, Manchester, 1894.

Cotton Spinning, RICHARD MARSDEN; London, 1884.

The Cotton Plant, United States Department of Agriculture, 1896.

Improvement of Cotton Seed by Selection, H. J. WEBER; Department of Agriculture, 1892.

Files of West India Bulletin and Journal of the Imperial Department of Agriculture for the West Indies.

Files of W. W. Gordon & Co., Sea Island market reports.

Digitized by Google

SEA ISLAND COTTON.—TABLE OF CROPS AND PRICES.

These are Average Prices First Cost Savanah for the Average Grade of Georgia and Florida Cotton.

SEASON.	CROP.				TOTAL.	Price.	FOREIGN EXPORTS.			American Consumption.	Stock Aug. 31.
	Florida.	Georgia.	South Carolina.	Texas &c.			Great Britai n	Continent.	Total Exports.		
1906-7 to April 19th,	18,772	29,493	7,921	. . .	56,186	30c.	12,928	5,642	18,560	35,620	3,215
1905-6,	42,437	67,215	13,712	. . .	123,364	18	24,897	9,206	34,103	90,484	1,197
1904-5,	32,026	58,471	12,171	. .	102,668	19	23,351	8,459	31,810	72,153	2,420
1903-4,	28,005	39,345	9,359	. . .	76,709	23	24,188	7,132	31,320	43,578	3,715
1902-3,	27,686	62,451	12,497	. . .	102,634	19	44,354	9,728	54,082	50,524	1,904
1901-2,	21,323	48,538	8,760	. . .	78,621	20	25,423	6,450	31,873	43,650	3,876
1900-1,	24,793	52,953	8,369	. . .	86,115	21	26,453	5,535	31,988	55,422	778
1899-0,	29,376	60,369	7,810	. . .	97,555	15	38,279	8,007	46,286	49,543	2,073
1898-9,	21,275	40,306	5,623	. . .	67,204	11	26,451	9,015	35,466	38,654	347
1897-8,	25,468	41,440	10,211	. . .	76,119	12	33,303	8,827	42,130	34,140	7,263
1896-7,	25,927	64,906	11,039	1,644	103,516	14	47,758	10,673	58,431	40,670	7,414
1895-6,	21,664	64,522	10,010	991	93,187	16	42,391	7,672	50,063	40,530	2,999
1894-5,	15,176	53,716	5,913	34	74,839	15	35,091	5,650	40,741	34,981	405
1893-4,	19,107	39,367	2,578	. . .	61,052	18	32,647	4,686	37,333	24,345	1,288
1892-3,	9,685	28,324	7,413	. . .	45,422	21	20,647	1,901	22,568	22,911	1,914
1891-2,	20,628	27,100	11,443	. . .	59,171	16	24,915	2,653	27,568	32,093	1,951
1890-1,	25,320	26,531	16,267	. . .	68,118	19	34,293	4,823	39,116	26,651	2,441
1889-0,	25,111	12,431	9,299	. . .	46,841	24	25,984	2,294	28,278	19,142	90
1888-9,	26,909	7,462	9,552	. . .	43,903	22	21,245	1,800	23,045	20,336	669
1887-8,	24,753	6,254	8,564	. . .	39,571	21	18,665	1,915	20,580	19,685	147
1886-7,	30,991	6,411	7,735	. . .	45,137	18	25,216	1,435	26,651	20,516	841
1885-6,	24,272	6,390	7,010	. . .	37,672	23	14,748	1,680	16,428	19,983	2,871
1884-5,	24,987	3,075	12,863	. . .	40,925	26	18,422	3,143	21,565	17,965	1,610
1883-4,	14,073	2,956	8,415	. . .	25,444	32	12,166	1,413	13,579	11,674	215
1882-3,	18,054	3,126	15,715	29	36,924	26	21,565	1,892	23,457	13,573	24
1881-2,	21,842	6,049	10,642	19	38,552	24	22,303	2,453	24,756	14,762	130
1880-1,	18,410	3,179	14,845	8	36,442	28	20,259	4,136	21,395	11,270	1,096
1879-0,	13,318	3,420	9,966	. . .	26,704	28	13,729	3,294	17,023	9,389	319
1865-79,	31,651	61,703	102,984	3,974	300,312	. . .	240,554	18,247	258,801	41,979	. . . .

Digitized by Google

The PRESIDENT. Are there any questions with regard to Sea Island cotton, which the members would like to put to Mr. GORDON? I regret the necessity of hurrying along, as we have to adjourn the meeting very soon.

The report of the Committee on Moisture in Baled Cotton by Mr. WILLIAM D. HARTSHORNE. Mr. President, I should of course be very much pleased to read this paper if it was so desired, but the time is so very close to adjournment, that I would suggest that I simply leave it in the members' hands, if that is your pleasure.

The PRESIDENT. Perhaps that may be the best course, Mr. HARTSHORNE. There is another paper on the program.

The SECRETARY. That paper has not yet been received and was prepared by Miss WARDLE to be read by title and put on the records, being a historical paper.

Digitized by Google

REPORT OF COMMITTEE ON MOISTURE IN BALED COTTON.

Your committee has not been able to secure as many tests of baled cotton as they deem desirable to formulate very definite conclusions as to the prevailing condition of the cotton as shipped, or as received at the mill, but they believe that they have formulated a sufficiently accurate method of taking the samples for obtaining approximately the true conditioned weight. The method depends upon the principle that the volume or weight of symmetrical solids is directly proportional to the cubes of corresponding dimensions.

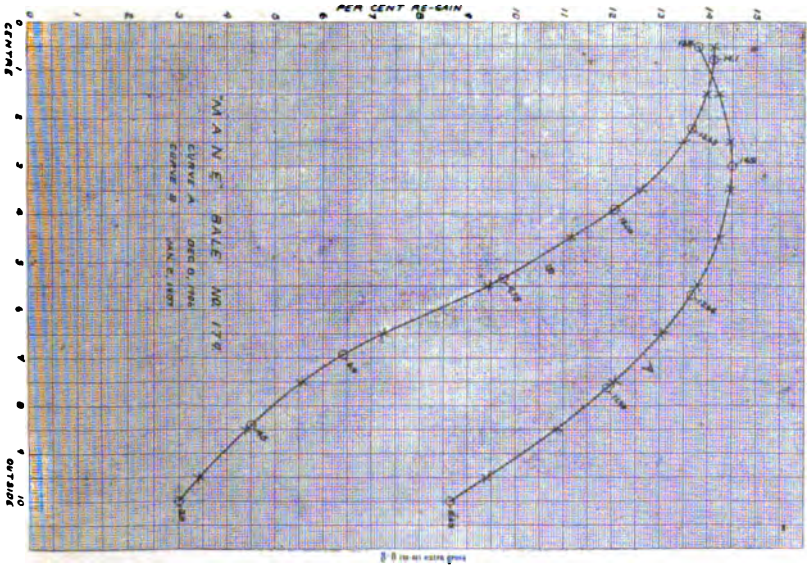
If it be assumed, therefore, that a bale of cotton is a rectangular prism with approximately equal ends and sides, each half diameter may be divided into ten equal parts, and interior prisms constructed on each of the several parts as half diameters, and the resulting cubic content of each of said prisms will be directly proportional to the cubes of the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. That is, beginning with the exterior prism or the whole bale, no matter what its actual dimensions are, its cubic content can be represented by the number 1,000. The bale whose half diameter dimension corresponds to $\frac{9}{10}$ of this will have the proportional content 729 and so on respectively, 512, 343, 216, 125, 64, 27, 8, 1. The amount of material in such a bale in the outside layer, or space between the whole prism and the first interior prism, will be equivalent to the difference between the content of the two prisms, or equivalent to the number 271; the material in the next layer will be equivalent to the number 217; in the third to 169; the fourth to 127; the fifth to 91;

Digitized by Google

the sixth to 61; the seventh to 37; the eighth to 19; the ninth to 7; ending with the middle prism equal to 1.

If it were practicable, therefore, to determine the actual moisture state of each of these several layers, the average condition of the whole bale could be easily calculated from the above figures. This is evidently not practicable to do commercially. The importance of observing the proportional effect of the condition between the outer layer and the interior layers is, however, manifest by reason of their difference in volume, and if there is much difference in the moisture state, it would not be proper to simply average the exterior test with any interior tests taken independently of their proper relations to each other.

For the purpose of demonstrating the theory a certain bale of cotton, No. 179 in the schedule of tests, was carefully weighed and tests taken at the exterior surface and at four points, at approximately equal successive proportionate distances within the bale, as shown on the curve marked *A*. The material for



Digitized by Google

these tests was obtained by carefully cutting out a core with a sharp chisel, and samples of the core as taken at the several depths were carefully sealed up and taken to the laboratory for testing. The results shown were unexpectedly large, so that instead of placing the bale in a damp location for the purpose of allowing it to absorb more moisture, as had been agreed upon in committee, it was placed over a hot air register and allowed to remain from December 15th to January 2nd, with occasional turnings. This bale was then re-weighed and taken to the picker room, where nails were driven into the end of the bale at measured distances apart. It was then immediately opened up, layer by layer, and samples taken from the surface, and from each successive layer which had been marked by the nails. These samples were carefully sealed up at the instant of taking and their condition determined in the laboratory. The results of these tests are shown at the points marked on curve *B*. The whole bale was then put through a mixing opener, and the loose cotton allowed to remain piled up in a bin for about two days. It was then spread out on the floor to the depth of about 15 inches, and allowed to remain for about 2½ days. Five samples were then taken from the top of this layer and five samples from the bottom, each carefully sealed up and the condition afterwards determined in the laboratory. The spread out material was then immediately gathered up and re-weighed, and the results are shown in the schedule following. Interpolated values were taken on each of the curves, *A* and *B*, to represent the condition of the several successive layers into which the bale was previously assumed to be divided. The comparative results of these three tests are given in detail below and comparison may be made with the original weight of the bale and its weights at times of testing:

Digitized by Google

MANE BALE NO. 179.

Received Nov. 13, 1906.	Net Weight	$510\frac{1}{2}$ Lbs.
Dec. 8, 1906.	" "	500 "
Jan. 2, 1907.	" "	$478\frac{1}{2}$ "
Spread-Weight (Samples Out)		469.5

BY CURVE A

9.4	x .271	2.547
10.85	.217	2.354
12.1	.169	2.045
13.05	.127	1.657
13.8	.091	1.256
14.25	.061	.869
14.45	.037	.535
14.45	.019	.275
14.2	.007	.099
13.8	.001	.014
Regain,		11.651 per cent.

$$\frac{500}{1.1165} = 448 \text{ Lbs. Dry Weight.}$$

REGAIN AFTER SPREADING.
(10 Samples)

Top,	6.5 per cent.
Bot.,	7.3
Top,	6.2
Bot.,	6.7
Top,	6.9
Bot.,	7.0
Top,	6.4
Bot.,	6.5
Top,	5.7
Bot.,	5.6
Av. =	6.48 per cent.

$$\frac{469.5}{1.0648} = 441 \text{ Lbs.}$$

BY CURVE B

3.4	x .271	.921
4.4	.217	.955
5.55	.169	.938
7.25	.127	.921
9.45	.091	.860
11.15	.061	.680
12.60	.037	.466
13.5	.019	.256
13.95	.007	.098
14.1	.001	.014
		6.109 per cent.

$$\frac{478\frac{1}{2}}{1.0611} = 450.9 \text{ Lbs. Dry Weight.}$$

Samples Added,	6.5 Lbs.
Dry Weight by Spreading =	447.5 "

It will be noted that the spread-out result gives for the absolutely dry weight a figure differing only one half a pound from that obtained by the first test as represented on curve *A*. The absolutely dry weight as shown by curve *B* differs from that of curve *A* by 2.9 pounds. This would in itself be probably near enough for practical purposes, but it is probably not as correct on curve *B* as on curve *A*, owing to the artificial conditions of prolonged drying which may have unequally dried the material throughout, in fact, the above figures are an average of duplicate

Digitized by Google

tests made on opposite sides of the bale. It is manifest, however, that the method above pursued could not be handled in a practical way.

Bale No. 172 was next examined by driving nails in the end, as previously explained, at distances, measured from the center towards both sides, of one-quarter, one-half, and three-quarters of the distance to the surface, and test samples taken at each of these nine places as the bale was opened up; the bale itself was put through the opener and treated in the same manner as No. 179, and the spread-out condition obtained. To avoid repetition of details, it is sufficient to say that the spread-out absolutely dry weight of the bale figured 506 pouuds, and the absolutely dry weight as figured from the tests as taken from one side gave 506.6 pounds, and from the other side 505.8 pounds. It seemed clear, however, that while this method was accurate a less number of tests might be used to give results commercially satisfactory. In the first place, it should be noted that individual tests on percentage of regain are not to be regarded as accurate nearer than the first decimal point, and that it requires a variation of one-tenth of one per cent. to make a difference of one-half a pound on a 500 pound bale. This is as close weighing as is practicable. No variation less than two-tenths of one per cent. need therefore be considered. If now we go back to our proposition of the cotton bale being considered as a rectangular prism, it may be considered as divided into two interior prisms, at points whose surfaces are relatively one-quarter and three-quarters distant from the center, and the respective volumes of the whole bale and the two interior prisms will be approximately as the numbers 1,000, 422 and 16, and the difference in volume between the whole bale and the first interior prism will be represented by the number 578, and between this first interior prism and the second by the number 406, leaving the interior prism 16. In any given case, therefore, where conditions have been found at the exterior, at three-quarters from the center and at one-quarter from the center (which may be designated by the letters *A*, *B*, *C*, respectively) we can apply the following formula for the average condition: —

Digitized by Google

$$.578\,\frac{(A+B)}{2}+.406\,\frac{(B+C)}{2}+.016\,C = \text{Approximate average condition.}$$

This formula applied to the readings obtained for bale 172 (see table of tests following) gives the average condition, 13.9 per cent. of regain. The weight of this bale at the time of testing was 576 pounds. $\frac{576}{1.139} = 506$ for the absolutely dry weight of the bale, the same agreeing with the figures already obtained. It is very interesting to note, however, that within the limits of error which we have stated it may be mathematically demonstrated that the simple average of the conditions at the three points prescribed gives with sufficient accuracy the desired information. Without entering into this demonstration, we give in the Table of Tests on Baled Cotton the figures obtained on 22 bales. This table is in a measure self-explanatory, and in the two columns marked "Simple average" and "Prism average" we have the comparative figures for each bale tested. Under the column "Calculated dry weight" will be found the figures obtained by dividing the net weight of the bale at the time of testing by 1 + the average regain expressed decimally. In most cases the results are identical, whether we use the simple average, or the prism average, and in this series never differs when weighing to the nearest half pound by more than half a pound.

The column marked "Dry weight + 8½ per cent." shows the net weight which the bale should have had at the time of invoicing, on the basis of the so-called standard practice abroad, and the difference between this weighing and the received weight, and also the invoiced weight, is shown in this table. It may be noted that on the first six bales we have the actual invoiced weight of the individual bale, but on the balance of the table the invoiced weight of the individual bale at the time of shipment could not be obtained, because of the obscurity of the numbering. The weights given are estimated from the difference in the whole weight of each shipment to which each bale belongs, as invoiced and as weighed in.

It is well known that there is often a very material loss in weight at the time of receipt at the mill over the invoiced

Digitized by Google

TABLE OF TESTS ON BALED COTTON.

Bale No.	MARK	FROM	RECEIVED	TESTED	Exterior Condition.	¾ Condition.	¼ Condition.	Simple Average.	Priam Average.	*Calculated Dry Weight.	Dry Weight Plus 8½ Per Cent.	Net Weight as Received.	Difference.	Net Weight as Invoiced.	Difference.	Actual Tare.
45	DUA	Egypt.	May 31, 1906	Jan. 29, 1907	8.7	8.5	8.5	8.6	8.6	621½	674	676	2	676	2	21
47	DUA	"	May 31, 1906	Jan. 31, 1907	9.1	8.7	8.5	8.8	8.8	661	717	722½	5½	723½	6½	20½
80	DUA	"	Jan. 22, 1907	Jan. 31, 1907	11.6	9.6	9.6	10.3	10.2	664½	721	733	12	728	7	23
54	RGO	"	Feb. 5, 1907	Feb. 7, 1907	10.0	9.2	9.2	9.5	9.4	620	673	679	6	678½	5½	22½
131	RAM	Blackstone, Ga.	Feb. 1, 1906	Feb. 7, 1907	8.5	8.7	8.6	8.6	8.6	357	387	401	14	397	10	11
40	RCR	Savannah, Ga.	Dec. 1, 1906	Feb. 1, 1907	9.5	8.9	8.9	9.1	9.1	417½	453	453½	½	453½	½	11½
5876	BA R9	New Orleans, La.	Jan. 23, 1907	Mar. 7, 1907	10.7	10.0	9.5	10.1	10.1	429½	466	474	8	483½	17½	26
3647	LICH	Memphis, Tenn.	Jan. 15, 1907	Jan. 29, 1907	13.3	10.3	10.1	11.2	11.1	523	567½	584½	17	591	23½	29½
1635	BANK	"	Dec. 10, 1906	Mar. 7, 1907	8.0	9.8	10.4	9.4	9.4	487½	529	534	5	541	12	22
179	MANE	Yazoo City, Miss.	Nov. 13, 1906	Dec. 8, 1906	8.6	12.0	14.4	11.7	11.5	448	486	510½	24½	519	33	21½
172	MANE	"	Nov. 13, 1906	Jan. 18, 1907	9.4	15.3	16.5	13.7	13.9	506½	549½	580	30½	590	40½	21
3098	HAMY	"	Jan. 7, 1907	Jan. 31, 1907	12.6	8.9	8.6	10.0	9.9	424	460	467½	7½	463	3	22½
3432	GAZE	Hope, Arkansas.	Jan. 10, 1907	Jan. 29, 1907	10.6	9.3	9.3	9.7	9.7	511½	555	556½	1½	552	4½	19½
4122	VARL	"	Feb. 5, 1907	Feb. 12, 1907	11.7	9.3	8.5	9.8	9.8	457	496	503	7	500	4	20
3559	SEMA	"	Feb. 26, 1907	Mar. 30, 1907	10.3	10.3	9.8	10.1	10.2	455½	494	500	6	500½	6½	21
5444	TEDY	"	Mar. 12, 1907	Mar. 30, 1907	10.2	9.5	10.1	9.9	9.8	480	521	529	8	530½	9½	19
3314	FUST	"	Jan. 18, 1907	Apr. 7, 1907	10.7	10.7	9.9	10.4	10.5	475	515	525	10	525	10	21
4443	FELT	Shreveport, La.	Jan. 30, 1907	Feb. 12, 1907	11.1	10.2	8.5	9.9	10.1	375	407	414	7	413	6	22
5407	HONZ	Greenville, Miss.	Feb. 13, 1907	Apr. 7, 1907	12.0	10.0	9.4	10.5	10.4	393	426½	437	10½	436	9½	25
6256	RIFS	"	Feb. 28, 1907	Apr. 4, 1907	11.4	11.6	11.1	11.4	11.4	482	523	539	16	539½	16½	27
3893	DIRK	Texarkana, Ark.	Jan. 18, 1907	Jan. 29, 1907	10.9	9.5	9.5	10.0	9.9	423	459	466	7	465½	6½	19
5849	FOOT	Pine Bluff, Ark.	Mar. 7, 1907	Apr. 7, 1907	12.5	11.1	9.2	10.9	11.1	457	496	517	21	499½	3½	23

* From the simple average only as being sufficiently accurate.

Digitized by Google

weight. On the other hand, there is sometimes a very large gain, showing that the cotton has been subjected to bad weather conditions in transit. It might be said that imported cotton usually runs very even from the inside to the outside of the bale, and the received weight approximates very closely to the invoiced weight. The cotton from the Mississippi Valley varies very greatly in its condition, sometimes being much more moist in the middle than on the outside, at least at the time of receipt. In the latter case it will usually be found that there has been a large loss in weight in transit, owing to the excessive moisture state of the whole bale. It is hard to suppose a condition of over 16 per cent. of moisture in the cotton to have been due to other than artificial conditions. This table shows that on these 22 bales the difference in weight at the time of invoicing exceeds the standard regained condition of 8½ per cent. by from one-half a pound to 40½ pounds per bale.

In order that further information may be secured on parallel lines, the committee suggests the following rules for obtaining samples and applying the information obtained from the tests showing their condition: —

First. Weigh the bale.

Second. Measuring from the center, drive a nail at one quarter and at three quarters the distance from the center to the position of the first hoop.

Third. Take samples when opening the bale from the exterior surface, and from each of the two layers above referred to, labeling them respectively "Exterior," "Three quarters," "One quarter,". Of course, the above nails should be located with reference to the side of the bale which is to be first opened.

Fourth. For the average condition of the bales take the simple average of the three tests above provided for, noting that it is important in order that this simple average may give a correct result that the location of the tests shall be as prescribed.

Fifth. Weigh the tare and get the net weight of the bale.

Digitized by Google

Sixth. To obtain the absolutely dry weight of the bale divide the net weight by 1 plus the average regain found. (Expressed decimally.)

Seventh. Add 8½ per cent. to the absolutely dry weight to get the so-called standard condition weight.

The difference between this weight and the actual weight at the time of invoicing represents the loss or gain to the buyer on above basis.

Respectfully submitted,

WILLIAM D. HARTSHORNE, *Chairman.*
CHRISTOPHER P. BROOKS,
LOUIS ATWELL OLNEY.

The PRESIDENT. We will now adjourn until ten o'clock tomorrow morning, not forgotting the banquet this evening at 6.30.

Digitized by Google

SECOND ANNUAL BANQUET.

HOTEL BRUNSWICK, WEDNESDAY EVENING, APRIL 24, 1907.

Following the custom introduced at the Annual Meeting of 1906, a banquet was held on Wednesday evening, April 26, at Hotel Brunswick. The members and guests assembled at six o'clock, and after a social half hour proceeded to the banquet hall.

The menu card was as follows:

MENU.

Cotuit Oysters — Cocktail
Radishes — Olives
Cream of Asparagus aux Soufflees
Consomme Imperial
Roast Spring Lamb, Mint Sauce
French Fried Potatoes — New String Beans
Sweetbreads en caisses, Toulouse
Roman Punch
Roast Jumbo Squabs
Endive Salad
Fancy Assorted Cake
Crushed Strawberry Ice Cream
Fruit — Cheese
Coffee — Cigars

The guests at the head and side tables were:

Digitized by Google

James R. MacColl,
Hon. George H. Utter,
William D. Hartshorne,
Hon. George P. Lawrence, M.C.,
George A. Ayer,
Hon. William C. Lovering, M.C.,
Walter E. Parker,
Hon. Wilbur F. Wakeman,
Robert McArthur,
Prof. Elihu Thomson,
A. M. Goodale,
Harvey Stuart Chase,
Arthur H. Lowe,
Henry K. Rowell,
Russell W. Eaton,
Samuel T. Hubbard,
Stephen A. Knight,
John Foord,
Charles H. Fish,
Herbert E. Walmsley,
Gen. Thomas Sherwin,
Robert Beatty,
Col. George A. Gordon,
Christopher P. Brooks,
Edwin A. Hartshorn,
George Otis Draper,
Adolph Suck,
Franklin W. Hobbs,
William H. Loftus,
Henry F. Mansfield,
Roscoe S. Milliken,
Charles T. Plunkett,
Franklin D. Williams,
C. J. H. Woodbury,

At the other tables were the following:

J. D. Armitage,
Louis A. Aumann,
Nathaniel F. Ayer,
Charles T. Barry,
Edwin E. Bartlett,
Albert F. Bemis,
John H. Bemis,
Frank P. Bennett, Jr.,
W. W. Blades,
Edmund E. Blake,
S. H. Bourne,
Arthur T. Bradlee,
J. A. Bryant,
Robert Burgess,
Frank H. Burt,
Stewart F. Carter,
C. H. Clark,
John A. Collins, Jr.,
F. B. Comins,
A. Crankshaw,
George Crompton,
Daniel J. Danker,
Frank J. Dutcher,
G. H. Eddy,
Frederick A. Flather,
Ellis Foster,
M. F. Foster,
A. S. Fowler,
E. T. Fowler,
Edward W. France,
John France,
Thomas A. Francis,
Roland Gerry,
Vladimir F. Gnesin,
Edwin Farnham Greene,
Z. D. Hall,
Nelson A. Hallett, Jr.,
Walter M. Hastings,
F. D. Heath,
Otis L. Humphrey,

Digitized by Google

Nathaniel Kinsman, Jr.,
Henry G. Kittredge,
Berry Laycock,
Evan A. Leigh,
W. Douglas Lithgow,
S. C. Lowe,
William L. Lyall,
H. F. MacCall,
William B. MacColl,
Robert M. Macintosh,
Augustus B. Marble,
Edwin H. Marble,
John P. Marston,
Charles E. Meader,
R. B. Meikle,
John T. Mercer,
J. R. Montgomery,
George B. Morison,
Frank L. Nagle,
Arthur W. Newell,
W. R. Noone,
Louis A. Olney,
William B. Orr,
J. Earle Parker,
G. Eaton Pierce,
William Price,
A. F. Raymond,
Nathaniel C. Robbins,
Alfred Sagar,
Dwight Seabury,
John Skinner,
E. Cowles Smith,
Thomas Henry Smith,
S. H. Steele,
Wallace I. Stimpson,
J. P. Strongman,
W. U. Swan,
John L. Tattersall,
A. C. Thomas,
James Thomson,
James P. Tolman,
Justin A. Ware,
George H. Waterman,
Newton Wilson,
George E. Zellers.

PRESIDENT MACCOLL, in calling the company to order, after the dinner said.

Gentlemen: It is fortunate for me and for you that no speech is expected on this occasion from the chair. The President of the Association is supposed to fire off all his speech making ammunition at the morning sesssion. I am afraid that if I were to speak at length I might talk upon what the old Scotch weaver called metaphysics. He was asked to define metaphysics, and said, "When the audience does not know what the speaker is talking about, and when the speaker does not know what he is talking about himself, that is metaphysics." [Laughter.] There is, however, one fact that I would like to call attention to, especially for the benefit of our guests, and it is this: that our industry has no large combinations or so-called trusts. There are three

Digitized by Google

or four concerns that represent possibly half a million spindles each, but I do not think there is any that controls over 1,000,000 spindles. Now, with 25,000,000 spindles in this country and with the modern ideas of business, it would not be surprising if there should be five or ten million spindles under one management, but that does not exist. And then again we have no "high finance" or "frenzied finance" in our business. There are no watered stocks. I do not know a single mill that has watered capital. I believe, on the other hand, that the great majority of cotton mills are under-capitalized and that the capital represents a great deal more value than is stated. We are in a sense old-fashioned business men doing business on honest, old-fashioned New England methods, and this suggests one or two ideas. It seems to me that there ought to be excellent opportunity for young men in the cotton business, because a young man can start a small cotton mill without fearing that an octopus trust will absorb or crush him; he can compete successfully with the large mills that exist. And the fact that there is no watered capital suggests the thought that cotton mills are a safe investment compared with many wildcat schemes that are offered to the public. It is a remarkable fact that many of the new mills in England have been built by contributions from the employees who work in them, and there is no reason why our employees in New England and in this country generally should not own stocks extensively in cotton mills and thereby create a better feeling and relationship between capital and labor.

Gentlemen, to take an active part in political life, to hold the highest office in the state for two terms, and to have the respect and confidence of every right thinking citizen is a record to be proud of. We have with us this evening a man who has that record, and I have great pleasure in presenting him to you — ex-Gov. GEORGE H. UTTER of Rhode Island. [Applause].

ADDRESS OF HON. GEORGE H. UTTER.

Mr. President: When the invitation to attend this banquet came to me there was nothing coupled with it to signify that

Digitized by Google

there was anything except a banquet. The only word that suggested to myself such a possibility was one short sentence which said, "Perhaps we shall call upon you to say a few words." Naturally, coming from a state like Rhode Island, with its various industries, and especially its industries in the cotton line, I turned to see if I could master a few statistics. You know it is one of the powers of a man in public life that with half an hour's study or so he can master statistics concerning any industry which Mr. MACCOLL and Mr. KNIGHT and a few other people here fail to master in a lifetime. [Laughter]. Such statistics, however, are a good deal like the map illustrating the Siege of Paris in the Franco-Prussian War which MARK TWAIN drew in one of his early works. The map, he stated, was shown to old King WILLIAM, who said he told his boy that if he could draw a map like that he would be willing to see him die — he didn't know but he would be anxious. [Laughter]. Any statistics that might be gathered for a half hour's talk, it seems to me, would be of that nature.

But a day or two after the invitation was received there came a program. I immediately felt relieved, because I saw that you had arranged your banquet on very much the same principle that you had arranged your meeting, or perhaps it would be better to say that you had arranged your meeting on much the same principle that you had your banquet — you had put the solids on each side of the sherbet. [Laughter]. Therefore it was only natural that a man who came to a banquet like this should be expected to speak rather lightly.

There is one danger, however, in this kind of speaking, and that is that to an audience made up of men who attend banquets pretty regularly, as I judge this is by its appearance, talks become monotonous, and monotony is a serious affair. Perhaps you have heard of that Yankee schoolma'am up in New Hampshire, who when asking for the definition of a word would also sometimes give a definition and ask what that signified. She said to her class one day, "Children, what do you call it when a man has a number of wives, as they do in Utah?" and up went

Digitized by Google

one hand and a boy replied, "Polygamy." "That is right, my boy, that is right. Now what do you call it when a man has only one wife?" and up went another hand and a boy responded "Monotony." [Great laughter.] And so one should beware, when he comes to a banquet, though he finds that he occupies the place of the punch, lest he become monotonous.

But after all you have got to have some monotony. It is the monotony of life that makes life worth living. There was once a man who was very sick. His friends thought there was something the matter with his brain. He went to see his physician, and he said, "Yes, he is breaking down from overwork; he needs a rest." So he was induced to talk it over with the doctor and the advice was repeated to him. "Oh," he said, "I can't take a rest, I am too busy; I can't get away." "Well, then," replied the doctor, "if you can't take a rest, you have got to take something to brace you up." "Well," said the patient, "I don't know how I am going to do that." "Why," said the doctor, "I should think about once a day you ought to take a nip of good whiskey, and perhaps it would carry you along all right." "I would be very glad to do so," replied the man, "but my wife would never allow any whiskey in the house." "I can fix that all right," said the doctor; "you shave, don't you?" "Oh, yes, I shave." "Well," said the doctor, "we will put it up in a bottle, and we will have it marked, 'Shaving Lotion,' and I guess that will be all right." So the patient took the bottle home and put it on his shelf. A week afterwards one of the boys came down in great consternation to see the doctor, and said, "Doctor, you haven't done father any good at all; he is worse than ever; he is going all to pieces." "How does he show it?" asked the doctor. "He insists on shaving anywhere from four to five times a day." [Great laughter.]

But I am glad that by what Mr. MacColl has said he has opened the way for me to talk on a different line. One of the beauties of having been an officer of a state and being so no longer is that you have graduated from the class of politicians, which so many of my friends occupy, into that of statesmen.

Digitized by Google

Therefore I am privileged to talk from a statesman's standpoint.

What I am going to talk to you about is a matter that I think an audience like this has thought about, and that makes it easier to talk, because it is always easier to talk about the things we have all thought about than of the things which none of us have thought about. I think it is a thing which we never can talk too frequently about. We are all intense Americans, and you are representatives of an industry which has helped to make America what it is. But do you ever think of the cardinal point, the central point, the beginning of the government that has made possible your industry? I want to speak of some points we are beginning to overlook, and we are seemingly by degrees forgetting. You people amass your money, you form your companies, you bring together your men, but they are safe only as the government gives them safety. You take your great mills and you take your great industries, and you build them up and set them up, but take away the government from back of them, and what safety have they? Why do you acccumulate and save for your family? Because you know that the government back of you will see that your family has that which you have accumulated. Weaken the government, take away its strength, make it nothing, and you have lost your impetus to work. And yet the thing that makes the government and the thing that makes progress is the individual effort. It is only as the individual progresses, it is only as the individual goes ahead, that you get a strong government. People do not go ahead in a mass. Some of you people have gone farther ahead than others. Some of you have looked ahead and longed for the time that you may go as far ahead as those who have already gone ahead of you. But it is only as a man puts his body and his mind and his soul into his work that he makes the way open for another man to go, and in that way he gets his inspiration.

Do you know what we are losing in this country? We are losing what is the cornerstone of our government and that is equality of opportunity. [Applause.] We say in our Declaration of Independence, "All men are born free and equal." All

Digitized by Google

men are born free and equal in this country only in opportunity. God never intended that two men should come into the world with the same brain and all of that, but He has sent men into this great country of ours with equal opportunity, and if we forget and allow any arbitrary division to come in and if we allow any arbitrary lines to be drawn that forbid men having an equal opportunity with other men, then we are unfaithful to the fundamental principle of the American government. [Applause.] This is not an idea that strikes simply at the employer, it is not an idea that strikes at the employee, but it is an idea for which the American people must stand if they are going to progress as they have progressed in the last hundred years. We must say that the man who is willing to sacrifice, the man who is willing to work 28 hours in a day if he wants to, shall have that privilege for his own benefit. [Applause.] You deny to the American people, you deny to the American boy, you deny to the man who has come in from a foreign land to begin here seeking a broader field and a freer opportunity — you deny him that privilege, and you deny the thing that has made your country strong and that will continue to make it strong. I have no fear of the trust, I have no fear of the labor union, I have no fear of any of those combinations and amalgamations, excessive as they are, except as they limit the opportunity, and when they undertake to limit the opportunity, whether it comes from the side of capital or whether it comes from the side of labor, it is a detriment and a threat to the whole United States. [Applause.]

Now, there is another thing that we are apt to forget which we ought to remember, and that is in addition to this equality of opportunity comes the community of interests. One of the things that we people here forget sometimes is what made us a nation. It was a wonderful thing that a nation should have been born along this Atlantic coast. Here was a composite people in a measure, and yet a people that differed; they began here in the North, and they ran South as far as Savannah and North Florida; they were all along that coast, and back of them was an unknown land. Here was a people who struggled to

Digitized by Google

free themselves from the Mother Country, not that they might set up a nation — it was not the thought of our forefathers that a new nation was to be born, but they struggled that they might secure this one right — that what was for the common interest of the colonies, the colonies might have. So they began a war that made a nation. Are we forgetting today those common interests? Are we making classes? Are we drawing lines? If we are, we are threatening another of our cardinal principles and are therefore endangering our people.

Only last year there were over a million people who came in here whom we are intending to assimilate and make American citizens. Many of them have come from a different section of Europe from which others have come. They are coming from a section of Europe where it seems that the idea of government from the first has been of oppression. What do you expect of a man who comes here from Russia, or from some of the countries of Southern Europe, with this idea nourished generation after generation, that government stands for oppression? We have got to take those men in, and we have got to show to them that goverment does not stand for oppression, but it stands for opportunity, and as it stands for opportunity it stands for responsibility. [Applause.]

There is where our danger lies today. Here is a danger that people like yourselves have got to keep constantly in mind. It is not simply the country of opportunity, it is the country of responsibility, and the man who comes here, who accepts what we give to him that he may build up himself and protect his family, also pledges to us the same responsibility that we pledge to him.

There are two things that every American citizen must recognize: He has got to recognize his responsibility to others; he must recognize the other man's responsibility to him. He must also recognize his own opportunity and the opportunity of the other man as well. Too many times we only half learn the lesson. We recognize our own opportunity and we talk about the other fellow's responsibility. The thing that we need

Digitized by Google

today is to bear down heavier on our responsibility and the other fellow's opportunity. [Applause.]

I like to talk, as I say, to an audience like this on matters of this sort, not because it is new, not because it is something you have not thought about, but because with such an audience goes back to its home and takes back ideas like these and undertakes to put them in force, we are gaining that thing that is going to leaven the whole lump. I am an intense believer in the future of my country. I have not a pessimistic hair in my head, as few as they are. I recognize one thing, though — I recognize that that thing which has made us great in the past is the only thing that can make us great in the future. It is only as we keep in mind that we are a republic, and a republic that has a community of interests, that we can maintain the land which opens its arms to all the world and says, "Here is a refuge for every man who is seeking to better himself." It is only as we can guarantee to those who come that which we enjoy ourselves and that which we demand for ourselves, an opportunity to labor and an opportunity to work, that we can make the country as a whole.

A few years ago I was going to New York one night on a Sound steamer from Fall River. Those of you who have been over that line I am sure have enjoyed your morning's experience, and it is no time for a man to lie in bed when he comes into New York on a Sound steamer. I came up on deck early and as we came down by the forts at the entrance to the Sound there came sidling up to me a young fellow with an unmistakable Jewish face. We fell into conversation and I asked him, "How long have you been in this country?" "Since I was eighteen," he answered. "How old are you now?" "Twenty-nine." "How did you come?" He told me his experience, how his father had bribed a man to let him get across the frontier, how a lad of eighteen he had found himself on a Dutch ship that had brought him to London, how he had gone thence to Liverpool and from Liverpool he had come here. I said, "How have you done?" He said, "Well." And as we came

Digitized by Google

down the river that morning Old Glory was flying on every side; every vessel we met in the sunlight was simply resplendent with the red, white and blue. That man could no longer contain himself, but he broke almost into the poetry of his ancestor, the old king and the wise singer of Psalms, as he said, "O Russia, hadst thou allowed thy children to do for thee what this country allows its children to do for her, no nation on the face of the globe could have withstood thee." [Applause.]

It taught me a lesson. It awakened in me a new thought and I have never gotten away from it, that if there is anything that the red, white and blue stands for today, it stands for an opportunity that leads the man to make the best of himself, no matter where he comes from or where he was born. [Applause.]

And how is this ideal to be attained? How are we to keep this country pure? How are we to maintain these privileges? We are to maintain them as you men and men like you as individuals put into force in your daily life and your daily associations that for which it stands. There is nothing on God's footstool that I so love as the great sea. It is nature's great life giver; it is nature's great purifier. You go down yonder harbor and you go a little way and the water is dark, and you go a little farther and it is clearer, and you get out beyond the Cape and it is beautiful, clear as God made it. All the filth of the great cities, all the fiith of the great centres, has been purified and driven out, and how? By the little drops that have come from the clouds above, by the little springs that have come from the bottom, bringing with them their salts that have been provided by the all-wise One to make that sea the great purifier of the world; and as those little drops, and little springs have done their share, the great sea is the purifier of the world. You men are the little drops, are the little springs, and as you do your part this great common country, the most blessed on God's footstool, the country for which men have died and for which men will die, and the country for which men have lived and for which men will live, will remain a blessing to the earth and a blessing to history and a blessing to all time and eternity.

Digitized by Google

[Great applause; The Red, White and Blue sung by the whole company.]

President MACCOLL. Gentlemen, as cotton manufacturers we are all interested in rivers and harbors. A good many of us have our own pet river that we are particularly enthusiastic about. In Congress the controlling force is the committee, and in the committee there are controlling minds who dictate and direct the policy of the committee. We are fortunate in having with us this evening a gentleman who is prominent in connection with river and harbor legislation. I have much pleasure in introducing to you the Hon. GEORGE P. LAWRENCE, member of Congress from Massachusetts. [Applause.]

ADDRESS OF HON. GEORGE P. LAWRENCE.

Mr. PRESIDENT. I thank you for this opportunity to sit at your hospitable board, and to share even for a moment in the great prosperity which has come to the cotton manufacturers of the United States. As one contemplates the progress which has characterized the industry you represent he is tempted to say that you are like the man who prayed, "Oh, Lord, I do not ask thee to give me wealth; just show me where it is, and I will attend to the rest." [Laughter.]

If you will pardon a local allusion, in 1837, seventy years ago, there were in the old township of Adams, Mass., nineteen cotton mills, and the combined product of those mills was about four and a half million yards a year. Today we have one company in that little town that produces more than fifty million yards a year. Seventy years ago, in 1837, there were two little calico print works in that town; together they employed about ninety people, and they printed in a year between four and five million yards of cloth. These two calico print works are still there, but they have expanded, and today their product is about one hundred and twenty-five million yards a year.

Digitized by Google

I am reminded of the story of a Dutchman who came to this country and made a lot of money and built himself a fine house in the city of New York, but thought that in order to have it just right there should hang upon the wall a portrait of his father. So he went to a great artist to engage him to paint the picture. The artist said, "Is your father alive?" He said, "No, he vas dead." "Well," said the painter, "bring me what photographs you have of him." He said, "We have no photograph." "Then tell me about him." "Vell, he vas a big man, and he had light hair and blue eyes and pink cheeks," and the artist went to work. Soon the portrait was completed. The Dutchman was summoned, he stood before the picture while the tears rolled down his cheeks, and he said, "Ah, that is my fader, but mein Gott, how he has changed!" If one of our manufacturers of 1837 could only inspect the colossal establishment into which his little mill has grown, well might he exclaim, "How it has changed!"

I think the most interesting continued story one can read today is the story of American industrial growth and commercial expansion. You read with amazement of the great increase of our national wealth; you learn with pride that we have become the greatest manufacturing nation on the face of the earth, that our manufactured product is more than that of England and France and Germany combined. More than five million people are engaged in this branch of industry, and we are especially proud of the great increase in our exports. And in this wonderful commercial development we know that the cotton manufacturers of the country have contributed their full share. They have written an important chapter in this story of wonderful industrial growth. American cottons have gone to the Old World in company with American locomotive and American harvesters and American floor.

As it has been my privilege to be a member of the committee on rivers and harbors of the House of Representatives for some years, it has been suggested that I say a word as to the duty of business men like those before me to advocate a broad and liberal policy of the improvement of the nation's waterways.

Digitized by Google

There are near me some skeptics. My friend, Governor UTTER, I think it was, whispered to me that he understood that the river and harbor committee was like charity — that is, that it covered a multitude of sins. [Laughter.] And still I can say truthfully that the River and Harbor Bill no longer merits the title of "The Pork Bill." It is generally agreed, I think, that under the inspiring and intelligent leadership of THEODORE E. BURTON, of Ohio, appropriations are no longer made for favored individuals, or for favored localities, but are made for the general welfare, and for the benefit of the commerce of the whole country.

The largest river and harbor bill in our history was passed at the last session of Congress. It carried in appropriations and authorizations about $84,000,000, although only $25,000,000 are to be expended during the current year. The largest appropriation for any harbor was that for Boston. We provided for the completion of the thirty-five foot channel, which it is estimated will cost about $8,000,000. Then we provided for the completion of the work of the southwest pass of the Mississippi River, the Ambrose Channel from New York to the sea, the Delaware River channel from Philadelphia to the sea, and the channel from Baltimore to the sea. Then there were $12,000,000 or $13,000,000 appropriated for the connecting channels of the Great Lakes. I think few realize how vast is the commerce dependent on the connecting channels of the Great Lakes. More than 55,000,000 tons of freight passed through the Detroit River last year. It is said that during the navigable season of the year a boat passes a given point in the Detroit River every seven and a half minutes. Of the sum appropriated for these connecting channels, $7,000,000 was for an alternate channel in the Detroit River. There is now one channel. Several times a boat has sunk and blocked that channel, and then for miles and miles and miles on either side of the obstruction boats are at anchor, for navigation absolutely ceases. Of course this is not businesslike, it is not common-sense to allow this vast commerce to be dependent on one narrow channel, so we have provided for another channel in the Detroit River. [Applause.]

Digitized by Google

One story that you have heard, and I suppose that you have heard it so long that you may believe it, is that a large amount of the appropriations of river and harbor bills are for streams of trivial importance, little rivers and creeks. How false that is can be seen from the statement that of the last river and harbor bill less than one-one-hundred and sixtieth was appropriated for streams bearing a tonnage of less than 100,000 tons in a year, and of a value of less than $1,000,000 a year. And I will say, because I want to pay tribute where tribute is due, that my friend Congressman LOVERING got a large share of that one-one hundred and sixtieth. [Laughter].

Of course I do not need to say to you business men that the cost of transportation is a problem of vital importance. You aid the producer, if you reduce the cost of transportation, because you enable him to reach more distant markets. The need of wider markets is generally recognized. Our prosperity, if it continues, must depend in large measure on the growth of our foreign commerce. Consequently, if we are to compete successfully in the markets of the world we must be able to put our products into those markets at the lowest possible price.

There has been a very great reduction in the cost of transportation in the last twenty-five years between this country and Europe. A quarter of a century ago it cost from eight to ten cents to carry a bushel of grain to Liverpool. Today you can carry that bushel of grain to Liverpool for between two and three cents. There has been a corresponding reduction on all outgoing and incoming freights, and that reduction has been due directly to the increased size of ocean-going steamships. Twenty-five years ago those ships drew eighteen or twenty feet of water and they were 300 or 400 feet long. Today they are veritable monsters, some of them a thousand feet long and draw thirty-two feet of water and more. And so it has been necessary for us as a commercial nation to equip our harbors with channel facilities suited for the ships of today. We have had to spend large sums of Boston and New York and Philadelphia and Baltimore and Norfolk and Savannah; at Galveston, New

Digitized by Google

Orleans and Mobile; then over on the Pacific coast are San Francisco and Portland and Seattle, and on the Great Lakes are Duluth and Milwaukee and Chicago, Cleveland and Buffalo. We have had to spend so much upon these harbors that we have to a degree neglected the interior rivers and canals of our country. And a most pressing reason exists today for a liberal policy with reference to them, because the railroads are absolutely incapable of meeting the demands for transportation. A little while ago New York state authorized an expenditure of more than $100,000,000 to enlarge the Erie Canal so that it would carry barges of more than 1,000 tons burden.

We must make our rivers great freight carriers and great freight regulators. Mr. JAMES J. HILL, the great railroad man, said in a recent speech that while the business of the country had increased from 1894 to 1905, 110 per cent. the transportation facilities had increased only 20 per cent. He said that we need 70,000 miles of new railroad in order to meet this condition and relieve the congestion. Now we know that we cannot hope in the near future for anything like that amount of new mileage of railroads, and so great interest has been aroused all over this country in the question of developing all our waterways, natural and artificial. Germany, France, Holland, and Belgium, have been spending great sums in this direction. ELSBACHER in a recent work on modern Germany hazards the opinion that Germany's industrial success is due chiefly — to cheap transportation and the wise development of her waterways. He says that water transportation has become a sport and almost a passion with the German business communities, and I commend to your consideration his statement "that it is economically wasteful not to develop to the fullest extent those great national resources, the country's waterways, both artificial and natural, and that it is suicidal and criminal to allow them to fall into neglect and decay."

At Washington last December there met the third annual convention of what is called the rivers and harbors Congress and there were present a thousand delegates, representative

Digitized by Google

business men from all over the country. They passed resolutions endorsing liberal appropriations for every worthy project. President ROOSEVELT has recently appointed a commission with Mr. BURTON of Ohio at its head to make a careful study of a comprehensive plan for the development of our interior waterways. That report will be laid before the next Congress and I have no doubt its suggestions will be very valuable. I am not so enthusiastic but that I realize there is a limit to what we can expend in this direction, but I believe every dollar we can expend is an investment from which the people will derive very large dividends. There are some statistics which are suggestive. During the last five years we have expended upon our waterways, our harbors and our rivers, $25,000,000 a year. During that same five years we have expended upon our army over $400,000,000 and upon our navy over $420,000,000. Don't you think that we could cut down just a little from our war expenditure and deal just a little more generously with appropriations for the benefit of our country's commerce? [Applause.]

And now only a word more. Of course in dealing with a subject of this kind we must be absolutely free from sectionalism. We must go upon the principle that what benefits one section of our country benefits the whole country. We have been making history very rapidly during the last few years. Some of it we are not very proud of; some of it we are a little ashamed of; but there are some facts which make us genuine optimists as we face the future, and one of the most refreshing facts of today is the rapid elimination of Mason and Dixon's line. Not long ago it was popular to waive the "bloody shirt" throughout the North; now it would not be tolerated anywhere. That cry which came from stricken Cuba, and brought on the Spanish War, hastened the era of good-will which was already dawning. Boys from my own part of the State who went to the Spanish War, fought under a Confederate chieftan, Gen. JOE WHEELER, and were nursed in the hospitals of Santiago by his daughter. [Applause.] When men of Alabama and men of

Digitized by Google

Massachusetts fought shoulder to shoulder, and showed that they were willing to die for the same flag, then of course there was an end of bitterness and of misunderstanding. I know that we shall have to get a little farther away from the horrors of reconstruction before there can be an entire end of sectional bitterness, but it is coming, it is coming rapidly. The people of the two sections are getting better acquainted, and that is all that is necessary. But it will always be necessary to preach union in this country of ours. How often do we hear the east and the west spoken of as antagonistic sections. What greater fallacy can there be? What difference does it make if the center of population is moving rapidly westward? What difference does it make if the political power exercised by the eastern states is less than in years gone by? This is one country. The loss of one section is the loss of all. There is no place in the Union for sectional bitterness or sectional jealousy. [Applause.] The welfare of the country demands the development of every state and all sections. In the words of a great American, "The quality, hope and destiny of our land is expressed in that phrase of the fathers, 'E pluribus unum'—of many, one; of many states, one nation; of many races, one people; of many creeds, one faith; of many bended knees, one family of God." [Great Applause.]

["Dixie" sung by the company.]

President MACCOLL. Gentlemen, we are honored by the presence of a gentleman who is a distinguished scientist and inventor, and in a field which is of great interest to us, the subject of electricity. I take pleasure in presenting to you Professor ELIHU THOMSON. [Applause.]

ADDRESS OF PROFESSOR ELIHU THOMPSON.

Mr. PRESIDENT. I understand it is to be our pleasure to have the body which is meeting here tonight on this occasion on a visit to our River Works at Lynn tomorrow. The works are

Digitized by Google

divided into two parts, and it would take a very long time really to see very much of them, and the visit, therefore, I believe, is confined to what is called the River Works, grown up within the last ten years or so.

I was asked to speak to you this evening on the general subject of electricity, since as cotton manufacturers you are large users not only in the way of light, but also in the way of power, and we are certain that you are going to increase in the latter direction and perhaps in the former. In regard to the subject of progress in electrical work, we can say that we have by no means reached the limit. Within a few years great advances have been made in many directions. Electricity is not properly to be spoken of nowadays as in its infancy. That would not be true. It is pretty well developed, and we are getting to the point where we can see perhaps that in some directions we are reaching the ultimate. For some twenty-five years the ordinary incandescent light which we see above us was the standard form of light. It was based upon cotton; we make our filaments from cotton. We did not make them from the cotton exactly in the way of cotton thread; although in the early days we did make filaments even of cotton thread; but nowadays we dissolve the cotton and make a gelatinous paste of it, force it through a die, dry the gelatinous material, carbonize it, and mount it in the lamp on the wires. It is based, therefore, on cotton, as the original thing. But we are gradually getting away from that, and in ten years from the present time it is probable that there will not be so much cotton used in incandescent lamps as there is today. It has been found within a few years that the efficiency — the amount of power required to produce a light of a given candle power, say sixteen candles, as an example — is not as high as it should be. We have for a long time dwelt upon the fact that most of the power was wasted in producing light. Even in the arc light, which is the most efficient of all the forms of electric light with which we are acquainted, we do not get more than about seven to ten per cent of the power in the form of light. In the incandescent light it was much below that, — not more

Digitized by Google

than two or three per cent in the form of light. In fact it has been found a very difficult problem to measure the exact amount of light that is produced in an incandescent lamp from the power expended on it, because the light is so small, there is so much heat produced and thrown away in proportion to the light, that the errors are great in the small percentage when we have tried to make a measurement. I do not know that it is absolutely decided yet, how efficient in light production these incandescent lights that you see above us are. Anyway, within two or three years attention has been drawn to the fact that with certain other substances in the place of the carbon filament of the lamp we can probably reduce the amount of power for a given light, at least in the proportion of one-half and possibly of one-third. That is, we would get three times as many lights of a given power, perhaps, from the same energy. It is interesting to stop for a moment to consider what that really means in horse-power, or what it means in coal.

If we assume that the best plant can give us a horse-power for one pound of coal per hour, and that that one pound of coal say costs us one-fifth of a cent, which might be a reasonable assumption, then the actual cost of lighting according to the newer plan, using metallic filaments, as they are termed, instead of carbon, would come out something like this: One cent for an hour in coal — leaving out all consideration of plant, expenses of maintenance or anything of that kind — just simply the coal — one cent would run about 180 sixteen-candle lamps. Now the plant costs and distribution costs, of course, come in to modify that expense, but it is gradually being reduced; slowly and gradually, we will find that this cost will be reduced, and I express, therefore, a strong faith that in some time to come electricity will be practically the universal lighting. On account of this extremely small expenditure required, electricity must become the lighting; kerosene, gas and everything else must give way. That is electrician's faith, and that is what he is trying to bring about, and that is what he is destined, I think, to bring about. But even then assume that we have what we call our tungsten metallic filament

Digitized by Google

in full swing; that these present carbon lamps are all replaced by such lamps—high economy lamps we call them—is that the limit? We are persuaded that it is not the limit. We have only to go still farther in the same direction, studying the substances which are provided for us in the minerals of the earth, and we can probably increase upon results steadily. The ultimate ideal, however, is to produce from our electrical energy nothing but light, or as little heat as possible. If we could get a lamp which turned 50 per cent. of the energy into light and the rest heat, lighting would be practically without cost — very little cost; our streets might be made ablaze like the light of day on a small expenditure all night long, and that is the ideal towards which we must look. If we cannot accomplish it by electricity we will have to accomplish it some way. The little fire-fly has already accomplished it long ago in the past ages of the world. The fire-fly flits around and gives us a light which, having been investigated, shows no heat rays; all the power emitted is luminous, and the amount of fuel which the fire-fly consumes in proportion to the light, is, as you can readily imagine, an insignificant quantity. When we can imitate that process of production of light which nature has evolved in the fire-fly, then this whole world becomes a blaze of light from little or no expenditure. That will be the ultimate thing; that will be the ultimate end of our lighting; we can go no further than that. Whether it will come in twenty-five, thirty, fifty or a hundred years we do not know. It may take longer than that. But we are certain—with the eye of science we can see far ahead; we can see that that is coming some day, and that succeeding generations, how far removed we know not, will benefit by discovery after discovery until finally that idea is attained. [Applause.]

Now, in regard to the other way in which we use electricity, and in which you use electricity. You use it not as a source of power, but as a means of conveying power. You have some source of power in the way of water-power or a steam engine or a gas engine, and you convert the energy which you get into electricity — into an electrical current. You can convert 97 per

Digitized by Google

cent. to 98 per cent. of the mechanical energy used to turn the dynamo into electriclty, and if your circuits are not too long you can convey that with a loss of only a few per cents., miles away, You then receive that current in the motor. You want to turn it back into mechanical power, and you can turn it back again with the same percentages, or in the same order of percentage, that is, a small motor may have 85 per cent., a large motor 90 per cent., a very large motor 95 per cent., and a very huge motor may recover 98 per cent. efficiency. So you have, as it were, a transmitting system which practically costs very little in loss to run it, the connection is so intimate, so perfect. Now, in the first introduction of electric motors what we called the direct current motor was employed, and a few of these motors were used for stationary purposes, such as working ventilating fans, light power and so on. Then came the electric railway. The electric railway was based upon the use of the direct current motor, a motor which has enormous power of starting, that is, what we call a very heavy torque at the start; you put on the load and the motor takes the load and carries it. It also has the possibility of very variable speed; that is, you can run the motor at different speeds at the different powers; hence, when the car is going up hill, the motor is working under what we call full load conditions at moderate speed; when it is running on the level it is doing perhaps a little less in duty but it is producing a higher speed. It is perfectly possible, however, with a similar type of motor to produce perfectly constant or steady speed, and these motors have been used largely for such purposes as require constant speed. The success of the electric railway has depended on these capabilities of the electric motor to handle extremely heavy loads, and we look forward as electrial engineers to the time when gradually — not all at once — the large railway enterprises of the country will adopt electricity. They must come to it; they are gradually coming to it. We produce electric locomotives more powerful than any steam locomotives, and do it easily. We produce trains which have no locomotives, which have there own self-propelling power on the axles, as in the elevated system, and we can, in

Digitized by Google

other words, accomplish with electricity what is absolutely impossible with steam; we can surmount grades that would be unthought of for steam roads, and do it economically, do it at good speed. So that the railway construction would be cheapened by the adoption of electricity in a country where considerable grade has to be surmounted. We therefore look forward to the time when, by degrees, almost all the railway systems of the country — certainly in the densely populated sections — will be electrified, to use a common expression. It is beginning around such centres as New York, spreading out into country some distance away, and on the successful culmination of the work in that direction, of course, the natural thing is that it shall spread.

But for your purposes; your demands in the mills are for an entirely different sort of power. You want above all things constancy; you want speed at a definite amount, and electricity provides you with what is called the polyphase system, or the system which sends out over the line three alternating currents which interlace each other so that when one is not pulling the other is pulling. It is like a three-cylinder engine; when one lets go the other laps into the intervals, and we get a transmission in that way which is perfectly steady, and the speed of which depends directly upon the spead of your generating plant. If you have a water-wheel with a bad governor you will have bad speed in all your motors. If you have a steam engine with an excellent governor, or a water-wheel with an excellent governor, governing within one or two per cent., you will have a similar accuracy of speed throughout all these motors driven in connection with the wires directly in that generating plant. Not only that, you can tie into one another this plant or that plant. You may have a stream coming down from the hills, and have a source of power up there. Farther down, a mile or two, two or three miles, ten miles, you may have another dam and a source of power there. Farther down you may have still another source of power, and you can tie into the system all of those generating stations and distribute that power over a territory which may be, say, fifty miles, a hundred miles in any direction by using elec-

Digitized by Google

trical currents of the variety we speak of. Your mill need not be directly at the site of the power; you can put it wherever it is convenient. You can take your power from a distance and use it whenever you please. In that way you get the mill work on an entirely different basis; you have electrified the mill. You take down your belting, you put a motor here and a motor there. It may be that you consider that a machine should be driven by its own individual motor; we call that the individual motor drive. It may be that you have several moderate sized machines which you would prefer to drive from a single motor; we call that the group drive. Whichever you use, you get the same character of power, and you get the same efficiency of transmission. You have, in other words, unified the system and yet you have segregated the system. You have made the single generator do all the work, and yet you have made it possible to cut off any piece of work at any point within the mill without disturbing the conditions of the rest of the mill.

Now, what farther advance, we might ask, is likely to take place in a system of that kind? I believe — I think I can speak advisedly on that subject — I believe that when you get that system in operation it never will be changed. It is the ultimate system; no improvement, — no improvement except in minor respects — no other process will ever take its place. And in that sense we may say we have reached the limit. And it is a truth which can be seen to stand out clearly in very many of our human undertakings, that we do reach certain limits after a time. If we investigate carefully, we find that there is a boundary. We make a machine which does work up to a certain point in a more or less perfect way, and the later improvements are merely details. So it is with electrical work. We make certain improvements; we produce certain apparatus, and we find there is nothing beyond. Some type is the final type, and when you have equipped your mill in that way you will never have to change or go back to any other system, or take out that machinery. And the durability of the machine is all that could be asked. There are dynamos which were made even in the crude days,

Digitized by Google

twenty-five years ago, still in operation, still in perfect condition or work, without any particular repairs. You have the motors which simply is something which runs on the shaft we call the rotor or the armature, whatever it may be; it runs on the bearings. If you keep your bearings in condition that motor is practically without any limit to its age. It does not change, it does not wear out; the electricity goes through the wire at the last just as it did at the first.

It may be interesting before I sit down to outline in a very brief and rapid way the manner in which electricity is supposed to carry power. It is not believed that the wire itself carries the power. The solid wire through which electricity is supposed to move — that does not carry any power. The real power either to be used for light or for heat or for making mechanical energy again in motors, goes outside of the wire. It travels along the wire outside, and the wire is merely the core; it is the guiding arrangement whereby the power traveling in the ether or the space outside of it, is simply delivered to the proper point. It flows, as it were, outside of that wire, and follows that wire wherever it goes. That is called transmission by ether. With an electric current, which is of the alternating current character, where it is a wave of current, of course this power is intermittently conveyed along the wire, so many times per second a pulse of power goes along the wire. By having three wires, and having the phases overlapping, one wire is idle while that is at work, and that wire is idle while this is at work, so we get another steady action. Now, if we were to raise the rapidity of those alternating waves to a very high degree — we use, say twenty-five cycles or sixty cycles per second, sixty waves up and down per second — we might make that six hundred per second. We can make machinery to do that. We might make it six thousand per second; we might make it sixty thousand per second; we might make it six hundred thousand per second; we might make it even millions per second, but we would find that the higher we go the more difficult it is to convey power along the wire, especially if the wire is round and of small

Digitized by Google

diameter, and we finally come to a condition where it is best to make the wire in the form of a thin sheet, like foil, and further on to widen that foil. I need not stop to tell you why that is, but there is an opposition, we may call it, when the round wire is used for such high rates of waves, and we get rid of this by spreading the wire, hammering it out into a sheet. And that leads me to speak of wireless telegraph, to try and give you an idea of just what occurs in that process. If we send currents along a wire, say six thousand waves per second, we lose a certain amount of power radiated along that wire. It goes off into space and does not come back. If we send even twenty-five waves a second we lose a very small amount, hardly to be measured, that goes off into space. We call that the radiation factor. But if we should make that instead of twenty-five waves per second, from two million to two million five hundred thousand per second, then this small amount, which with twenty-five waves per second does not amount to anything, is increased one hundred thousand times, because each wave radiates just as much whether it is going fast or slow. In other words, two million five hundred thousand waves per second radiates 2,500,000 times as much power as one wave per second. Then it comes to this — that if you get the rate high enough you radiate all your power; you do not have any coming back; in other words, there is no use for a return circuit. You do not have to bring your circuit back; you send the electricity out over the wire, and it is all radiated into space. The wireless telegraph consists merely of a wire run up into the air one end of which connects with the ground, generally near the sea, — better near the sea, — and we send a charge of electricity oscillating millions of times a second, it may be, up and down that wire. The power which it represents is radiated from the wire, and instead of having a wire to convey the impulse to a distant point, we have the surface of the earth. We have our wire hammered out into a sheet, we have it spread out, and that is the surface of the earth. In other words, the surface of the earth is our guiding wire. It is spread now in all directions, and it guides that energy in all directions, and

Digitized by Google

although the earth is round — spherical, the waves follow the round earth by following the surface just as if our wire was flattened out into a great sheet. And still again, the conducting substance, the salt water of the earth, is guiding the energy as it was when you put up the wire and set up a lighting plant. The two things are perfectly identical.

As an interesting illustration of this principle I may say that from Brant Rock, below Boston, signals were sent to Machrihanish, Scotland messages were interchanged, and one curious fact was noted — that whenever a signal came to Machrihanish from Brant Bock, about a fifth of a second later, that signal was repeated very feebly. It meant simply this — the only explanation possible, that the wave went around the earth the other way and came up on the other side. [Applause.] And a fifth of a second, if you calculate it out, is just about the right time for it to take. Electricity travels, like light, at the rate of 180,000 miles per second. You find out the distance around the earth, and you know how much additional time would be required to go around the earth, which corresponded exactly with what was observed. It is the only explanation possible in the case. If we could produce waves of electricity so rapid that they were at the rate of four hundred millions of millions per second — that is a pretty high number — four hundred millions of millions per second — if we could turn all our energy that we use into waves of that rate, then we should not have what we call electricity any more, but it would still be electricity — we would have red light. Red light is nothing but electricity, after all, with electrical waves at the rate of four hundred million of millions per second; yellow is about five hundred millions of millions per second, and when we get up to a violet light we have about eight hundred millions of millions per second. And hence the problem of getting what we call "cold light" is to manufacture electrical waves of such high rapidity, instead of using them at twenty-five or sixty cycles, we want four hundred, five hundred, six hundred, seven hundred, eight hundred millions of millions of cycles, and then we would

Digitized by Google

be able to produce the light at once without any great loss, provided, of course, the process of producing did not involve a great loss.

I have tried in these few moments of time to give you a general idea of this subject, and I will, in closing welcome you all down to the plant at Lynn where we will meet you and see as much as we can in the short time of the actual work of turning out electrical machinery. I thank you, gentlemen. [Applause.]

President MACCOLL. The next speaker needs no introduction to the older members of this association, as he is one of our ex-presidents, but to the younger men like myself he is known as the representative of the cotton industry in Congress. We are proud to recognize him in that capacity, and I hope he is proud of our industry and our association. He has recently taken an active part in the passage of a measure which has been of great benefit to textile manufactures, the free alcohol bill. Congressman WILLIAM C. LOVERING of Taunton. [Applause.]

ADDRESS OF HON. WILLIAM C. LOVERING.

Mr. PRESIDENT. Not until I saw my name on this program or menu did I expect that I was to address you this evening, and therefore I am as unprepared as the ex-governor of Rhode Island, who by the way, called himself as a retired governor, a statesman. That reminds me of what TOM REED said when he was asked, "What is a statesman?" "Well," he said, "it is a politician who is dead." [Laughter.] Our friend REED said a great many good things. I think one of the best things I ever heard him say, if I may digress for a moment, was when JERRY SIMPSON, who was the member from Medicine Lodge in Kansas — "Sockless Jerry," as he was called, — arose and addressed the speaker. He said, "Mr. Speaker, the gentleman from Texas (Mr. BAILEY) has spoken on both sides of this question, and he has voted on both sides of this question. It is difficult to understand where the gentleman from Texas stands on this

Digitized by Google

question." The speaker very solemnly said (rapping on the table), "Gentlemen must not interrupt each other or make unreasonable requests." [Laughter.] That brought the house down, as you well understand.

But to be serious, my friends, it is a pleasure to me to meet you here again. I certainly was president of this association many years ago, before we could have a dinner and champagne and all that sort of thing. We used to get out and get a twenty-cent bite, and come back again and do our business. But associations have grown richer in these days, I notice. I am reminded of an association of Dutchmen in New York who met not long ago and dealt out funds to various charities, and after they had got all through one member rose and said, "Mr. President, we have done a good day's work. We has given moneys to help the people travel abroad and get an education; we has given moneys to help young students; we has given moneys to several charitable objects, but we has done nothing for the poor, nothing for the poor. Now, I move, Mr. President, that we give three rousing cheers for the poor." [Laughter.] That isn't being serious, is it?

I don't wish to sound a discordant note here when everything is so harmonious, but I think the manufacturers of New England have something to complain of. You take the account of stock at intervals; you know to a yard how much goods you have on hand. You take an account of stock of your physical property, your machinery; you know whether you have the best and latest and most improved machinery. You take the most accurate account of stock of that. But there are certain things going on which affect your own business which I fear you do not take account of stock of, and I want to allude to just one thing and then I will sit down.

The cotton crop of this country — the most valuable crop, almost, that we have — not the most valuable in money, perhaps, but the second — and the most delicate crop in the world — is the poorest handled crop that we have. It is handled as badly today as it was a hundred years ago. There has been no improvement in it.

Digitized by Google

But that is not all. There are several methods — I will not speak for any particular one — of putting cotton up in a condensed form and delivering it to you at your mills at the point of concentration or of destination, which are absolutely discriminated against by the railroads of the country. The result of it is that the cotton crop of this country, if you reduce it to single car miles — is carried 50,000,000 of miles for nothing — and in carrying it 1,000,000 single car days is wasted — 1,000,000 days is wasted in carrying that cotton, and carrying it for nothing. One million days are equal to 2,700 years. It means that it is an equivalent to carrying the entire cotton crop 50,000,000 of miles or 2,000 times around the earth in a single car, or twenty times around the earth in a hundred cars. And who pays for this work? Does the railaoad do it for nothing — really for nothing? They don't make any charge for it. But they make a charge on all cotton at the same rate, and the result is that you are paying today, and the planter who is raising the cotton is paying today for that extra haulage, and that waste of time. It can be ciphered out that it would mean many, many, many millions of dollars to you and many millions of dollars to the planter. I give you that just as a thought, my friends, and leave it to you.

I can back up every word I say, and the time is coming when I assure you somebody is going to take account of this thing and somebody is going to apply a remedy. [Applause.]

President MACCOLL. The American Protective Tariff League has done valuable work in disseminating information throughout the country on the great question of protection, and in combatting the continual attempts that are being made to undermine the tariff. I am glad to present to you the secretary and treasurer of the American Protective Tariff League, Hon. WILBUR F. WAKEMAN, of New York. [Applause.]

ADDRESS OF HON. WILBUR F. WAKEMAN.

Mr. PRESIDENT. I esteem it a high honor to be here tonight. It is a great pleasure to stand before producers. I do not pro-

Digitized by Google

duce much personally, consequently it is a great pleasure to meet producers.

Pardon me if I refer first to a splendid address that was delivered to you today by Mr. EDWIN A. HARTSHORN of New York. If you did not hear that address I want you all to read it, and read it carefully. I have had long and personal relations with Mr. HARTSHORN. It was in the fall, I think, of 1897, when I was looking around for a good man and the best man I could find to be assistant appraiser for the district of New York; Mr. HARTSHORN did not come to me, I went to him. After canvassing every one I could find I found that he was the best man I could get, and he has been assistant appraiser of that district from I think the fall of 1897 until a few days ago. He knew the law, he knew American industrials, and he has given you splendid service, and a service which you ought to remember. Consequently I say that if you did not hear his address today I want you to be sure and read it. I shall refer to some points in his address later. But I want to say this, that during my administration as United States Appraiser of the District of New York, the weak points of administration referred to by Mr. HARTSHORN did not exist.

I feel incompetent to follow the eminent gentlemen who have addressed you this evening. About three years ago I was a guest at a great dinner in New York of the Silk Association of America and his Excellency, the Governor of Rhode Island was introduced, and he made a most powerful speech. He carried the banqueters almost off their feet, and I wish to say that his speech tonight was fully as good as the speech delivered at that dinner.

I am a protectionist. I believe that protection is the keystone of patriotism. Patriotism is love of country, and you cannot have love of country without having love for your fellowmen, and you cannot express love for your fellowmen without giving them the opportunity of employment. Protection is that national policy which fills that gap from a national standpoint, and gives you the opportunity of furnishing that employment.

Digitized by Google

I have not heard a word said tonight — and I am glad it was left to me to say something for this policy — of its past, its present, and its future.

Of its past, you know and I know that every time that adequate protection has been extended to American industry it has resulted in prosperity, both from a national standpoint and from an individual standpoint. It is needless for me to refer to your own success at the present time or to that of other industries.

Secondly, referring to the present, we have a very dangerous condition. The mouthpiece of New England, from the standpoint of the press, is Boston, and the mouthpiece of Boston is for tariff revision and tariff reduction. And I should say that ninety-nine per cent. of this talk is in Boston, and emanates from Boston for the entire United States. And in proof of that let me cite this: We had a congressional election last year — an off year. We had local conditions that were hard to meet in many states; and in that off year there was not a single document but one put out by the national committee but what was for protection, adequate protection for every American industry. Result—a Republican Congress was returned by sixty majority.

Again, and emphasizing this point, let me refer to another point. You remember that we had what is called the Phillipine tariff bill up for consideration, and fifty-seven republicans and thirteen democrats voted against this proposition. Of the fifty-seven republicans who voted against this edict, fifty-four were returned, which is in excess of the majority for the entire Congress. Of the three one came from a republican district and the two from democratic districts.

Of the present, we have what we might call a relaxation of administration, or a lowering of the bars without legislation. Yesterday, as you noticed by the cable despatches, the committee of thirty of the Agrarians, agriculturists and manufacturers of Germany, approved of the German agreement which has already been signed in behalf of this government, consequently, that agreement is practically approved. I want to call your attention to what that agreement means. I will only mention two points

Digitized by Google

in it, for I want you to take it home with you and think it over, and think how it is going to affect your own interests.

One proposition is this: that the little local chambers of commerce throughout the German Empire shall state to the American Consul the value of given goods. Bear in mind, we are taking sixty millions of commerce from Germany; we did last year. Secondly, the American Consul shall certify this value given to him by this chamber of commerce, and thirdly, that the American appraising officers shall accept as evidence this attestation or statement of value. Tell me, if you compete with any German goods, what position you are in after this goes into effect, which means that the exporter from Germany becomes the appraising officer of competitive goods with your own. Next, the special agents of this government in the future shall be persosa grata to the German government. The investigators — I am stating the condition of this agreement — the investigators of this government, looking after merchandise competitive with your own, shall report to the German government their business before they make their investigations. Result, no investigation.

There are further conditions in connection with this agreement that are not so important as the two I have mentioned. This agreement, having been extended to Germany, must under the "most favored nation" treaty clauses, be extended to other countries. Result, tariff revision and tariff reduction in the next sixty days without legislation.

Of the future. I received a letter yesterday from one of the greatest manufacturers of this country, and an eminent diplomat who is known to many of you. If you will pardon me I will read one extract from his letter. This is from Gen. WILLIAM F. DRAPER of Massachusetts, a member of this Association, dated Rome, April 9.

"What possesses some of our business men, and even some of our manufacturers, I don't know. Because they are making money *today* they seem to feel that they can make it under any circumstances or

Digitized by Google

conditions. I know that if the tariff is reduced in some lines it will either stop business or cause wage reduction; and wage reduction in important lines is likely to run through the whole community.

Of course if we *could* cut down wages so that we can manufacture on equal terms with the foreigner, the business would go on, but this would be a damage to our laboring class and our civilization, besides reducing our home market."

The day before, it happened, I received another letter on the same subject. This was from the president of our organization, Hon. CHARLES A. MOORE, who has a factory in the adjoining state of Connecticut, and another in New Jersey. Referring to the future, as I said, he says:

"So let us watch every corner sharp and hit every Tariff Reformer and Free Trader that bobs up his head for any honors. *Warn* Protectionists to beware of theorists and experimenters under whatever banner they parade for it is only a question of time when they bring up in the Free Trade Army. Also it is well to warn Protectionists to stand by the policy of Protection for we are drifting away too much now, if we hope to hold the Protectionists of this country together."

I have referred to the past, to the present, and briefly to the future. I wish that every one of you gentlemen — every one of you — would take five or ten minutes every day, and I wish you would lock yourselves up in a telephone booth and just pray for the right way to go, and then go together — go all together — stand together. I remember today I was talking with a manufacturer in your line. "Why," he said, "we have in our directory three Protectionists and two Free Traders." Says I, "That is good." He said, "How would you handle that matter?" "Why," I said, "I would let the Protectionists take the dividends when the mill was running, and I would let the Free Traders take the dividends when the mill was silent." Get together, stand together, pull together; for I tell you, gentlemen, and I say it in all the earnestness that I can express, there is grave danger in the near future.

I thank you very kindly for your attention. [Applause; "The Star Spangled Banner" sung by the company.]

Digitized by Google

President MACCOLL. Gentlemen: We have come to the end of the list of speakers on our programme. The speaking this evening, has been of unusual merit and we are greatly indebted to these gentlemen who have come and added so much to the intellectual part of our banquet. You may remember that a year ago we had as guests the English Commission who visited this country to investigate the subject of cotton growing. We have with us this evening the rear guard of the English Commission, Mr. JOHN L. TATTERSALL, who is a prominent English manufacturer, and I want to ask him — though he has not had any notice of this — to say a few words to us. Perhaps he can inform us what the Commission said about us when they got back, or he may be able to tell us whether he has been converted to the policy of protection since he came to this country. [Applause.]

REMARKS OF MR. JOHN LINCOLN TATTERSALL.

Mr PRESIDENT. I think it would have been more fair to me had I had at least five minutes' notice to prepare something to say to you, because it is rather difficult at a moment's notice to say anything worth your listening to. But I should like to say this, Mr. MACCOLL, that it has been a very great pleasure to me to be present at your meetings here in Boston, and to meet so many men with whom I have common interests. I am one of those who have taken a great interest in the formation of what we call our "International Federation" in Europe, we have as members of that Association practically all the European countries; we have members from India, and I understand from our secretary that Japan has officially joined us. I should take it as "a feather in my cap" if, any word I might say tonight should lead you on this side of the water to think about joining hands with us in this International Federation. So far, we cannot say to you, "We have done this and we have done that;" but I can assure you, gentlemen — I think Mr. MACCOLL will agree with me — that the very fact of all these different nations meeting together, has swept away already many of those influences which

Digitized by Google

have been telling against our trade and our mutual confidence. Our people in Lancashire have very wrong ideas indeed about you. I can assure you if I was to tell you all they thought about you, you would not be altogether complimented. [Laughter.] They are afraid to come here because they are so afraid the Yankees might take them in. [Laughter.] I have been told by some friends here that I am half a Yankee already. I have only been here three weeks; I don't know what I should become if I was here three years. I can however, assure you, gentlemen, our people have a very wrong opinion. I have received nothing but kindness, and my friends who were here last year said the same. But I do think that that cry "America for the Americans," is perfectly absurd for a great people such as your great republic. It is all right for little Denmark or little Sweden to say, "Denmark for the Danes," "Sweden for the Swedes." But, my dear sir, "America for the Americans" is absolutely childish. [Laughter and applause.]

I have listened to the remarks about protection, and as a free trader I would rather not discuss them. I would only say, that I hope, so long as I tread this little earth, you will have the same opinions that you profess tonight, because in England we wish you always to be Protectionists, and high Protectionists. Put on duties as high as you like; we don't mind one little bit, because, fortunately, there are other countries that buy goods besides America, and certainly this one thing is true, that the higher your duties are the less are you gentlemen able to compete with us in foreign markets. That may appear a fallacy to you, but that is the way we look at it. I have no wish to see you a free trade country, so with our friend here I hope you will always lift high the banner of protection. [Applause.]

There has been mention made about the mills we are putting up in England. Mr. MacColl, in his address, made a remark that he was afraid England, when bad times came, would be "dumping" her surplus manufactured goods down here; and you would have to shut up your mills. Well, I sincerely hope that time will never come. I am indeed perfectly certain that it

Digitized by Google

can never happen — with people such as you have here, as you are quite capable of looking after your own interests. As Mr. MacColl has said, we, in England, have put down something like ten million spindles in the last two or three years; some of the mills of course have not yet been completed. People who think about these things are a little bit nervous, and really begin to think we have gone too far. Mills were put down three years ago at a sovereign a spindle, whilst the mills that are going up today are costing thirty shillings a spindle. That means a great difference in the net first cost. When you come to work at a profit of $1\frac{1}{32}$ of a penny per pound, the interest charges on that 50 per cent. higher cost made a big difference.

Then again, we are very much afraid that our people have put too much money in this thing; they have paid only small amounts on their shares, and when the bad times come we are afraid there will be cheap mills for sale in England. I should advise you gentlemen here instead of going forward and putting more mills down, to keep your spare cash ready, and come over to our country and buy cheap mills. I met a man in Philadelphia, he said, "You are the first Englishman who ever told me the secrets of the common trade." I said, "That is what I have come over for. I haven't come over to get everything for myself; I want to give something away as well. I always find if I give a little away I get a lot more back." "The fact is," he said, "you know, when you Englishmen come here you always appear so awfully simple, till we really believe you are simple; but it is surprising when we get you at close quarters we find you are not so simple as you look."

We are pretty well in touch with you, so many Americans come over to our country, and we hear all you have to say and watch all your movements, and so we are every day learning lessons from you. We have a high esteem for all you gentlemen. I would not like to touch on politics, because we have a very poor opinion of your politics here. We are fond of elections in the old country, but we go about it very quietly. We have none of us personal axes to grind. We may have our

Digitized by Google

personal opinions, but that is all, and so we do not take perhaps that exciting interest in politics that you do here. I wish sometimes that in this country you took a keener interest of a different kind in politics. I should like to see the politics of this country as clean as they are in England, and then your country would indeed become the strongest and finest the world has yet seen. I tell you, gentlemen, that man for man the American people I have met are a long way superior to Englishmen of the same type. Their individuality and character are more strongly developed, and you throw greater energy into your work. With this personal superiority and the wealth and magnificence of the natural resources of your great country, surely it is rather undignified to make so much of the cry "America for the Americans." [Applause.]

[The company joined in singing "My Country 'Tis of Tnee" and "Auld Lang Syne," which concluded the exercises of the evening.]

Digitized by Google

THIRD SESSION.

THURSDAY MORNING, APRIL 25, 1907.

The Convention met at Huntington Hall at 10 A. M., the president in the chair.

The Secretary read the following telegram:

CHARLOTTE, N. C., April, 24.

C. J. H. WOODBURY, *Secretary*,
National Association of Cotton Manufacturers,
Boston, Mass.

The American Cotton Manufacturers' Association extends greetings to the National Association of Cotton Manufacturers and wishes them all a most happy and successful meeting, and trusts the entire body will attend our meeting in Philadelphia.

C. B. BRYANT,
Secretary and Treasurer.

The PRESIDENT. I am very glad to call upon the president of the American Cotton Manufacturers' Association, who is also one of our ex-presidents, and known to you all, Mr. ARTHUR H. LOWE.

Mr. ARTHUR H. LOWE. Gentlemen, I am very glad to be here to emphasize the invitation which has been sent by the

Digitized by Google

secretary of the American Association. The American Cotton Manufacturers' Association is planning to have a convention in Philadelphia. If there are any of you who have not been advised of that fact it is an oversight on the part of Mr. BRYANT, and I want to assure you all that you are most heartily and cordially invited to attend the meeting in Philadelphia. In connection with the convention we have arranged for an exhibit of machinery, the newest and latest devices and attachments, which we think is going to be very interesting and valuable feature of the convention. I am very glad indeed to emphasize this invitation, and extend personally, as a representative of that Association, a cordial invitation to you all to attend the convention, and we would be pleased if you would all join our Association. I thank you, Mr. President, for this opportunity to present the matter.

The PRESIDENT. What action shall we take in regard to this telegram of greeting and invitation? Is there any motion to be made?

Mr. C. J. H. WOODBURY. Mr. President, I move the Secretary be instructed to send a vote of thanks to Mr. BRYANT for his kind invitation.

The motion was seconded and carried.

ELECTION OF MEMBERS.

The Board of Government submit with their approval the following list of candidates, recommended for election to membership in the Association.

FOR ACTIVE MEMBERSHIP.

JAMES H. ABERCROMBIE, Mech. Supt. Clark Thread Co., Res. 97 Heller Parkway, Newark, N. J.
By E. R. BULLOCK.

Digitized by Google

G. Bion Allen, Sec'y Pawtucket Branch J. &. P. Coats, Ltd., 117 Mulberry St., Pawtucket, R. I.
By E. R. Bullock.

Louis A. Aumann, Agent Chicopee Mills, Dwight Mfg. Co., Chicopee, Mass.
By Edwin Farnham Greene.

R. Bloss Billings, Treas. and Mgr. Utica Dyeing Co., Utica, N. Y.
By Charles Hayes, Jr.

Louis W. Bishop, Prest. and Treas. Blackstone Webbing Co., Pawtucket, R. I.
By W. W. Blades.

Harry H. Blunt, Treas. Wonolancet Company, Nashua, N. H.
By H. D. Lord.

J. C. Bolon, Supt. Lancaster Mfg. Co., Lancaster, Mass.
By Henry D. Martin.

George H. Booth, Agent Gosnold Mill, New Bedford, Mass.
By John A. Fernley.

Joseph W. Booth, Asst. Supt. Atlantic Mills, Providence, R. I.
By George E. Spofford.

Charles N. Borden, Treas. Richard Borden Mfg. Co., Fall River, Mass.
By Alexander Makepeace.

Edward Bromley, Member of Firm of John Bromley & Sons, Lehigh Ave. & Front St., Philadelphia, Pa.
By Robert Beatty.

Paul Butler, Prest. Whittier Mills, Chattahoochee, Ga., Lowell, Mass.
By W. R. B. Whittier.

Hamilton Carhartt, Prest. Hamilton Carhartt Cotton Mills, Rock Hill, S. C.
By Peter H. Corr.

D. Allison Carrick, Treas. Sycamore Mills, 65 Franklin St., Boston, Mass.
By John Sullivan.

Digitized by Google

ALFRED L. CLARK, Supt. Greene & Daniels Mfg. Co., 32 Central Ave., Pawtucket, R. I.
By HENRY C. DEXTER.

G. ARTHUR COOK, Sec'y West Boylston Mfg. Co., Easthampton, Mass.
By GEORGE A. AYER.

AMOS CRANKSHAW, Supt. Cotton Yarn Dept., Lorraine Mfg. Co., Pawtucket, R. I.
By W. W. BLADES.

GEORGE CROMPTON, Supt. Middlesex Bleachery, 53 Bay State Ave., Somerville, Mass.
By ARTHUR C. FREEMAN.

JOHN A. CROSSLAND, Asst. Supt. Skenandoa Cotton Co., Utica, N. Y.
By CHARLES HAYES, Jr.

JOHN CROWTHER, Treas. Shannock Narrow Fabric Co., Pawtucket, R. I.
By W. W. BLADES.

GEORGE W. DUNN, Purchasing Agt. Lancaster Mills, Clinton, Mass.
By HENRY D. MARTIN.

CHARLES H. EAMES, Principal Lowell Textile School, Lowell, Mass.
By FREDERICK A. FLATHER.

WM. KENDALL FAIRBANKS, Agt. Bigelow Carpet Co., Market St., Lowell, Mass.
By J. C. WADLEIGH.

EUGENE N. FOSS, Prest. Burgess Mills, 34 Oliver St., Boston, Mass.
By BOBERT BURGESS.

ALLAN A. FREEMAN, Prest. Atlantic Fibre Co., Sloatsburg, Rockland Co., New York.
By STEWART F. CARTER.

ALFRED C. GAUNT, Treas. Tremont Worsted Co., Methuen, Mass.
By WILLIAM D. HARTSHORNE.

S. P. GEROW, Sec'y The Cornwall & York Cotton Mills, St. John, N. B.
By JOHN B. CUDLIP.

ALBERT H. GOFF, Mill Supt. D. Goff & Son, 29 River St., Pawtucket, R. I.
By DWIGHT SEABURY.

J. POTTER HARRINGTON, Supt. Saratoga Victory Mills, Victory Mills, N. Y.
By R. S. MILLIKEN.

Digitized by Google

HARRY T. HAYWARD, Prest. Forestdale Mfg. Co., Franklin, Mass.
By WILLIAM B. ORR.

AMOS G. HOSMER, Mech. Supt. Lancaster Mills, 40 Chestnut St., Clinton, Mass.
By HENRY D. MARTIN.

ELISHA H. HOWARD, Agt. Slater Cotton Co., 49 Church St., Pawtucket, R. I.
By JAMES R. MACCOLL.

WALTER J. HOWLAND, Supt. Hebron Mfg. Co., Hebron Mills, Hebronville, Mass.
By DAVID GROVE.

W. S. HUME, Supt. Hamilton Woolen Co., Amesbury, Mass.
By C. P. BROOKS.

FREDERICK L. JENCKES, Agt. Jenckes Spinning Co., Pawtucket, R. I.
By C. P. BROOKS.

JAMES B. KERR, Agt. American Thread Co., Kerr Mills, Fall River, Mass.
By ARTHUR PARKINSON.

LEONARD C. LAPHAM, Treas. Nonquitt Spinning Co., New Bedford, Mass.
By ANDREW J. CURRIER.

BERRY LAYCOCK, Supt. Franklin Mills Corp., Unionville, Franklin, Mass.
By W. W. BLADES.

WILLIAM A. LEHAN, Supt. Burgess Mills, 133 Mineral Spring Ave., Pawtucket, R. I.
By ROBERT BURGESS.

RUSSELL B. LOWE, Prest. Parkhill Mfg. Co., Fitchburg, Mass.
By ARTHUR H. LOWE.

C. W. MACARA, Care Harry Bannerman & Sons, Ltd., 33 York St., Manchester, Eng.
By J. R. MACCOLL.

JOHN E. MCLAUGHLIN, Sec'y Treas. and Mgr. La Tosca Yarn Mill, Utica, N. Y.
By ROBERT P. MCLAUGHLIN.

CHARLES E. MEADER, Agt. Lowell Bleachery, Lowell, Mass.
By DANIEL J. DANKER.

Digitized by Google

BERNARD F. MERRIAM, Treas. Cordaville Woolen Co., South Framingham, Mass.

By JOS. MERRIAM.

WALTER C. METCALF, Prest. Cordaville Woolen Co., Westboro, Mass.

By JOS. MERRIAM.

ALBERT D. MILLIKEN, Supt. New England Cotton Yarn Co., 237 Summer St., New Bedford, Mass.

By JOHN A. FERNLEY.

WILLIAM A. MITCHELL, Mfg. Supt. Mass. Cotton Mills, P. O. Box 1230, Lowell, Mass.

By W. S. SOUTHWORTH.

JAMES P. MURRAY, Prest. Toronto Carpet Mfg. Co.. King St. and Fraser Ave., Toronto, Canada.

By FREDERICK A. FLATHER.

THEODORE O. NICHOLSON, Treas. Millen Mills, 65 Franklin St., Boston, Mass.

By JOHN SULLIVAN.

THOMAS PERKINS, Jr., Asst. Supt. Tremont & Suffolk Mills, 28 West Bower St., Lowell, Mass.

By A. M. CHADWICK.

CHARLES M. PERRY, Supt. Glenlyon Dye Works, Saylesville, R. I.

By. J. R. MACCOLL.

VICTOR E. PIHL, Mech. Supt. Boott Mills, 869 Bridge St., Lowell, Mass.

By FRED LACEY.

J. H. REANEY, Mgr. Royal Gem Mills Co., St. Johnsville, N. Y.

By GEORGE E. FARRELL.

HIRAM L. REYNOLDS, Supt. Saunders Cotton Mills, Saundersville, Mass.

By A. E. ADAMS.

RICHARD G. RILEY, Supt. Davol Mills, Fall River, Mass.

By GEORGE H. HILLS.

W. K. SANBORN, Supt. R. W. Lord Co., West Kennebunk, Me.

By R. W. LORD.

ROBERT SCHOFIELD, Supt. N. E. Cotton Yarn Co., P. O. Box 380, New Bedford, Mass.

By JOHN A. FERNLEY.

Digitized by Google

WINFIELD S. SCHUSTER, Vice Prest. Forestdale Mills, East Douglas, Mass.
By T. B. STEVENSON.

EDWIN G. SHEPARDSON, Supt. Kilburn Mill, New Bedford, Mass.
By JESSE A. KNIGHT.

ROBERT A. SMITH, Asst. Supt. Mass. Cotton Mills, P. O. Box 1230, Lowell, Mass.
By W. S. SOUTHWORTH.

DEXTER STEVENS, Supt. Yarn Mills, Lancaster Mills, Lancaster, Mass.
By HENRY D. MARTIN.

JOHN A. STEVENS, Chief Engineer, Merrimack Mfg. Co., 78 Hanks St., Lowell, Mass.
By J. C. WADLEIGH.

WILLIAM M. STEVENSON, Supt. Hodges Fibre Carpet Co., Indian Orchard, Mass.
By GEORGE A. AYER.

HENRY W. STONE, Supt. Holliston Mills, 296 Walpole St., Norwood, Mass.
By FREDERICK A. FLATHER.

THOMAS STONE, Supt. Taber Mills, New Bedford, Mass.
By C. P. BROOKS.

JOHN B. STRONGMAN, Treas. Gosnold Mills Co., New Bedford, Mass.
By C. P. BROOKS.

JOHN LINCOLN TATTERSALL, Director Robert Hyde Buckley & Sons, Ltd., 69 Royal Exchange, Manchester, Eng.
By J. R. MACCOLL.

JAMES THOMSON, Asst. Mgr. Dwight Mfg. Co., 53 State St., Boston, Mass.
By NATHANIEL F. AYER.

RIDLEY WATTS, Commission Merchant Grinnell, Willis & Co., 44 Leonard St., New York City.
By J. R. MACCOLL.

HAROLD C. WHITMAN, 39 Leonard St., New York City.
By J. R. MACCOLL.

MERTON J. WILMARTH, Supt. J. L. & T. D. Peck Mfg. Co., 44 Myrtle St., Pittsfield, Mass.
By ERNEST E. CLARK.

Digitized by Google

GEORGE A. WILSON, Supt. Whitman Mills, 171 Davis St., New Bedford, Mass.
By JOHN A. FERNLEY.

NEWTON WILSON, Supt. Samson Cordage Works, Shirley, Mass.
By JAMES P. TOLMAN.

R. L. WILSON, Gen. Mgr. Floyd Mills, Rome, Ga.
By H. P. MEIKLEHAM.

GEORGE E. ZELLERS, Mgr. John Farnum & Co., Nos. 2 and 3 Mills, 214 South Prince St., Lancaster, Pa.
By FREDERICK A. FLATHER.

FOR ASSOCIATE MEMBERSHIP.

W. IRVING BULLARD, Vice Prest. E. H. Jacobs Mfg. Co., Danielson, Conn.
By J. A. ATWOOD.

EDMOND H. GUERIN, Mgr. American Paper Tube Co., Woonsocket, R. I.
By WILLIAM P. WOOD.

GEORGE B. HAMBLIN, Purchasing Agt. Whitin Machine Works, Whitinsville, Mass.
By G. M. WHITIN.

JEFFREY HAZARD, Prest. Hazard Cotton Co., Providence, R. I.
By J. R. MACCOLL.

CHARLES M. HEMINWAY, Treas. Consolidated Engine Stop Co., 130 East 12th Street, New York City.
By HUGH NELSON.

NATHANIEL KINSMAN, Choremi Benachi & Co., 53 State St., Boston, Mass.
By ROBERT BEATTY.

DANIEL G. LANGLANDS, James S. Roberts Co., 137 Portland St., Boston, Mass.
By W. W. CAREY.

AUGUSTUS B. MARBLE, Jones & Laughlin Steel Co., Board of Trade Bldg., Boston, Mass.
By DANIEL J. DANKER.

Digitized by Google

EDWARD L. MARTIN, Selling Agent, Howard & Bullough American Machine Co., Pawtucket, R. I.
By HENRY C. DEXTER.

W. C. MURPHY, Union Hardware & Electric Supply Co., Providence, R. I.
By D. GROVE.

JOHN PERKINS, Sales Agt. Hewes & Phillips Corliss Engines, 735 Oliver Bldg., 141 Milk St., Boston, Mass.
By W. W. CAREY.

CHARLES ROBBINS, Eng. Westinghouse Electric & Mfg. Co., Care of Westinghouse Electric & Mfg. Co., East Pittsburg, Pa.
By MELDON H. MERRILL.

H. COWLES SMITH, Mgr. Eastern Dist. Acme Flexible Clasp Co., 28 Elm Street, New York City.
By GEORGE OTIS DRAPER.

ADOLPH SUCK, Mill Architect & Engineer, 179 Summer St., Boston, Mass.
By J. R. MACCOLL.

GAY D. THAYER, Salesman, Crompton & Knowles Loom Works, 667 Main St., Worcester, Mass.
By H. D. MARTIN.

THOMAS WINN, Textile Department, The Arabol Mfg. Co., 100 William St., New York City.
By FREDERICK A. FLATHER.

The PRESIDENT. I will appoint as tellers to distribute, collect and count the ballots for membership, Mr. JUSTIN A. WARE and Mr. JOSEPH MERCER. I understand from the Secretary that there are ninety-one names on the ballot.

The committee attended to their duty and submitted the following:

REPORT OF COMMITTEE ON ELECTION OF MEMBERS.

The committee appointed to collect, sort and count ballots for

Digitized by Google

new members reports that eighty-seven ballots have been cast all for the list as recommended by the Board of Government.

Respectfully submitted,

JUSTIN A. WARE,
JOSEPH MERCER.

The PRESIDENT. I declare these persons duly elected members, and I wish to ask the Secretary what the membership of the Association now is.

The SECRETARY. Nine hundred and sixty-one members.

The PRESIDENT. The first paper on the program this morning is entitled The Textile School a Necessity to the Future of the Industry. We have now several very good schools in New England but we recognize that the pioneer textile school of this country and the most important school still, is the Philadelphia Textile School. The director of that school is one of our members and has spoken to us on previous occasions. We are very glad to welcome him here again at this time, and shall take pleasure in having him speak to us, Mr. EDWARD W. FRANCE. [Applause.]

Digitized by Google

THE TEXTILE SCHOOL A NECESSITY TO THE FUTURE OF THE INDUSTRY.

EDWARD W. FRANCE, Phialdelphia, Penn.

I assure you I esteem it a special privilege to once more have the opportunity of addressing this organization on the all important question of textile education.

For the past twenty-three years, I have been associated with this movement, having had the pleasure of starting in with the first efforts of the Philadelphia Textile school, in the year 1884, which school has the distinction of being the first successful one of its kind in this country. All honor and credit is due to the founder of the Philadelphia School, Mr. THEODORE C. SEARCH, through whose initial effort, and the success which the school has attained, we now have not less than twelve Textile schools along the Atlantic sea-board; only two, however, aim to cover instruction in more than one fibre. But we have accepted the principle of teaching the subject of textile manufacture through schools, and there is still a good deal of room for discussion regarding methods, and the nature and extent of the possible development of a movement which is still quite new.

The textile industry of the United States, has for the past year or two, been passing through an experience the like of which has never before been witnessed in this country. I refer to the great scarcity of artisan labor-spinners, weavers, and machine tenders in general. The cotton mills of our southern states are perhaps more severely affected by this scarcity than those in the northern states, although there is a considerable scarcity of manual labor in all classes of industrial work, but the cotton

Digitized by Google

mills in general, north and south, have suffered more, perhaps, than either the wool or silk. Cotton mills as a rule, depend more on cheaper labor than wool or silk mills, made possible, partly by the automatic and semi-automatic machinery now in use and when times are prosperous, such as the present, this cheaper labor is naturally the first drawn upon by the higher paid industry, no matter what its kind. The former employers of this cheaper labor have no other source from which to replenish their supply than that which comes from the increase through imigration. To such an extent has this been going on in the last few years that it is now apparently necessary to post mill notices in no less than six foreign languages in some of our textile centres.

The speaker can well remember the time when a large majority of textile mill operatives in and around the cities of Lowell and Lawrence, Mass., were of American birth, the balance being English, Irish, German and French Canadians; the latter, however, being in the minority. From this source, and this source alone, it was then customary to recruit the mill managers, etc., and from sheer force of fitness many of the best mill managers and superintendents we have today, were recruited from the ranks of the men just mentioned. But this has now all changed; a new era has arrived; the sons and daughters of these former mill operatives are not following the footsteps of their parents, and are to be found in almost any other vocation rather than that of textile manufacturing, at least not in the purely mechanical or producing end of the work, and their places are now filled as before mentioned, largely by foreigners. The cotton mills of such cities as Fall River and New Bedford, which are strictly cotton manufacturing centres, are fast filling up with Portuguese, Russian Jews, Armenians and other foreign races. Now labor of the kind just mentioned is not of the so-called educated class, in fact, many of them have had practically no education, none have had mill training, and while they can be taught to perform the various functions of machine tending, they cannot without further education and the

Digitized by Google

facilities to study the underlying principles of the machine, be expected to do or become any more than a part of the machine itself. They have no elasticity or interchangeability.

Our modern factory system does not permit of a schooling along this line; the keen competition of the day demands that the efforts of every employee shall be concentrated to the part of the work he or she was engaged to perform, leaving no opportunity for an acquaintance with preceding or succeeding operations; the tendency of all this is to lessen the value of the man in relation to the product he is able to produce. It can thus be seen that through invention the more automatic the modern machine becomes, the less important the machine tender becomes, and the vastly more important the man above the machine tender must necessarily be. The opportunity of this individual therefore, has grown with the complexity of the machine. So much so has this become a fact that as the improvements in textile machinery have progressed there has been a constantly growing tendency among textile manufacturers to divide all their labor into two great classes — machine tenders and directors of machine tenders. These latter are intended to include the designers, dyers, assistant superintendents and managers. Upon the shoulders of these men depend the quality and quantity of the product produced. Now it will readily be seen that unless these men (the directors of the machine tenders) have a thoroughly practical knowledge including all the possibilities, as well as the limitations of the machines over which they have control and a fair working knowledge of preceding and succeeding operations, the results in the product will be poor and unattractive. On the other hand, if the abilities of these men are of the proper kind, we may naturally expect a reflection of this ability in the results produced and consequently, a product of the highest order should be attained.

I have stated that the labor which is now entering our textile mills is practically of a very ignorant class, and that the factory system does not permit of a schooling other than to teach the labor how to mind the machine. I have also said that with

Digitized by Google

very few exceptions, the machine tending operative's usefulness is very much impaired owing to his limited knowledge of preceding and succeeding processes, and finally, I have said that the good or bad results in the product of any of our modern mills very largely depends not only upon the adaptability, but the kind of men in charge behind the operatives.

Now, if what has just been stated is true, and I think that it cannot be denied, the question would naturally arise, where shall we look for our future men of managerial responsibility? Where shall we look for the men who are to create our new designs and colorings? Surely, we cannot expect to find them from among those who have had no training other than that of machine tenders. More especially is this true when we seriously consider the modern and ever changing requirements of dame fashion, to say nothing of the economic questions which are so unavoidably associated with the styling end of the problem. My unhesitating answer to these questions is, that it is to the textile school that we must look for our future designers, chemical dyers and managers. No other agencies can so well supply this needed efficiency; more especially is this true if we hope to raise the standard of our productions above that which may be termed ordinary "staples". That the textile school will be an absolute necessity to the future welfare of the industry I have not the slightest doubt and upon this point I think we are all fairly well agreed, otherwise the textile schools even now in existence along the Atlantic seaboard would never have been established, but what we are most concerned about to day is not so much the means to adopt to attain the end, as it is the methods to employ in the schools themselves to secure the desired results and therefore, upon this point will hinge the entire question of textile education of the future.

Textile manufacturing in this country has reached enormous proportions. I am aware that we have among our mills some of the largest and best equipped in the world, but at the same time I am also persuaded that there are many not as intelligently managed as they should be, and very many, where

Digitized by Google

thought is expressed only in imitation of the artistic product of some more ably conducted and progressive competitors. This weakness is most noticeable in the preparation of raw materials, in design and color, in dyeing, printing and finishing, and usually we find hand in hand with them a great lack of economic method.

To correct these conditions, is, or should be, the work of the kind of textile school I have in mind. To me, textile education means the embodiment of all instruction which may be practically included in the requirements of a good, sightly and saleable article, whether it be in cotton, wool, worsted or silk. Beyond this it is needless to go. What we want to teach in our textile schools is exactly what the apprentice should be taught in the mill — to do actual things — to produce actual stuffs. Hand in hand with this instruction must go all necessary information required for these productions from the raw to the finished state, not omitting a thorough training along the artistic as well as the commercial side, which stands for the money value of the products produced. Less than this will not supply the needed ability that the various branches of the textile industry demand; to attempt more would be to cut down the time actually needed to fulfil the above requirements. Textile schools, again, should be divided in two classes, higher and lower schools. The higher school for the training of those who aspire to positions of responsibility such as designers, managers, superintendents, stylers, salesmen, etc., whereas the work of the lower or primary schools should be devoted to the training of the man behind the machine, who must be helped and inspired before anything like a fine or high performance is to be expected from him. Indeed this latter training is quite as urgent as that of the former, and to fail to make proper provision for it, is to miss the chance of accomplishing one of the main purposes for which all technical and iudustrial schools should stand.

There is a disposition on the part of some well-meaning friends of industry and of education, to underrate the impor-

Digitized by Google

tance of this practical trade instruction, and to regard technical education, which has reference to the aims, not of the skilled artisan, but of the engineer, as the only worthy object to be sought in this connection, I respectfully dissent from this view of the case. We need the textile engineer of course, and his education is a legitimate and proper aim — there is no doubt about that — but we do also need, all along the line, the skilled and tasteful master workman whose hands are still on the lever or in the vat, for whom the uplift and outlook of education are as essential, and will prove as profitable, as that which is bestowed upon his softer-handed fellow. The education of these two will be along somewhat different lines, but we make a great mistake when we think we can do without either one.

Technical education, to be effective, must be of college grade, which means that the men who are to profitably pursue it must be not less than eighteen or twenty years of age, and must have had the benefit of a preparatory schooling which has virtually monopolized their time and energy up to that age. Again, the atmosphere and euvironment that would be highly desirable for a trade school may be most unfavorable for a technical school of college grade. The trade school appeals to people who are, with few exceptions, already employed, and most, if not all, of its work must be done in the evening. It should be located, therefore, in the mill town, however narrow and exclusive the limitations of educational opportunity implied by this classification may be. The technical school, on the other hand, must be a day school, and should offer those opportunities for the more liberal culture and larger educational outlook which, however unfortunately, are hardly to be found except at the great centres of population and enterprise. The distinction which is thus made between the two classes, or grades of instruction which the present occasion demands, is indispensable to any clear understanding of the problems involved.

The technical school appeals to and will attract, comparatively few students who are properly qualified to profit by the courses which it offers. How true this is the whole history of textile

Digitized by Google

education in England as well as in America, shows only too plainly. The education of the mechanical engineer, with of course more or less reference to textiles, is a branch of college instruction of great, and probably of increasing importance, but textile engineering, as such, is too narrow and special a field to attract great numbers of properly qualfied students, and the number of such schools, whose results will satisfy their promoters, will always be limited. On the other hand, every mill town of any importance should have its evening trade school, in which the operatives of every grade can be helped and encouraged, along lines of thought and action to which their minds are already accustomed, to work towards higher and higher planes of practical accomplishment, and we need not be afraid of overdoing this part of the work. Every industrial community offers a field for this kind of educational effort, and those who are to be reached and helped by it, are to be numbered, not by hundrens, but by thousands.

Another thing, the higher education is of necessity so interlocked with the commercial that it is almost impossible to treat on the one without entering the field of the other. So much so is this a fact that it has always been one of the aims of the Philadelphia Textile School to have the commercial aspect of the questions involved, studied side by side with the technical, and to do this has meant the installation of such an equipment, including carding, spinning, weaving and finishing machinery, that it is possible to carry each problem through the various processes from the raw material to the finished state, endeavoring to work as near as possible along typical lines, such as would be the case with similar products in the factory itself.

It is not then for demonstrating principles alone that an equipment of the kind just mentioned is required — it is for practical production, and from these productions — and these alone — we are able to clearly judge not only the understanding of the student of what was desired from the theoretical instruction given, but also his capability and adaptability to actual production; and right here, allow me to say, it must borne in mind

Digitized by Google

that not every applicant for textile education is eventually to become a success as a textile designer, simply because he may have been advised to take up this work as a vocation, but I know from experience that by working along really practical lines, he will very soon find out for himself just how far his artistic, as well as his mechanical abilities are likely to carry him, and thai such abilities as he does possess will be directed into the proper channels.

Such a system demands exceptional ability in the teaching force, for this intimate association all through the school, of the artistic, the theoretical, and the practical, is by no means easy to attain, and the instruction given should be so dove-tailed from one department into the other that the successive operations can be as thoroughly carried out as would be the case in the mill itself.

It is not, as you all know, the intrinsic value of an article alone that makes it salable. Far from it; its first requisite must be that it is attractive. It must have some snap in both color and design; moreover its finish must be good and the price must be right. If these various factors are what they should be, a sale is usually possible, otherwise, all the mechanical skill required in the production goes for nothing. This statement holds equally true in all industrial work, the artistic element in color or design independent of structure must assert itself, or there will be no sale. For instance, the woodwork in a suite of furniture may be all that could be desired in style, workmanship and finish, while the textile covering may be entirely out of keeping in both color and design, but perchance, it was the best to be had, and consequently was used at the sacrifice of all the other good qualities shown in the frames themselves. To this end we claim that all textile students should study the grammar of ornament; understand periods and historic styles, and know how to properly embellish a fabric as well as how to make it; know the good as well as the bad qualities of a design, and thereby learn to avoid the one just as readily as to accept the other.

Digitized by Google

Drawing is also an indispensable requisite in the education of all textile students, no matter whether the aim is to work along the lines of cotton, wool, worsted or silk. By accepting this study, one is bound to form the habit of looking upon both sides of his problem. He becomes more tasty, and at the same time more broad; his imagination is improved and thereby his constructive ability. He can, through this ability, oftimes see wherein it may be possible to reconstruct a design, improve its character without increasing its cost.

Color is another study of the utmost value to the student of textiles; in fact, I may say it is one of the most important, and yet one of the most neglected in most of our schools. No matter what other good qualities a fabric may possess, if the color combination is not right, the fabric will not sell, or at least, will not bring by any means what it should in the market. A thorough study of this subject should be a prominent feature in all textile schools. While the principles of color are the same, whatever their application, the course of study must be so arranged as to bear entirely on yarns and fabrics. The eye of the student must be trained so as to know what is good and what is bad in color combination. He should eventually become able to not only decide what colors or shades may be tastefully combined, but also on the relative depths of tone which will be allowable under given conditions, and in given combination. His knowledge of fabric structure and design should enable him to estimate correctly the quantity and quality of color which will be visible upon the face of the goods and enable him to make correct allowance in his original scheme for the modification of effect which these conditions imply.

This is only one of the many studies in textile production which cannot be brought down to pure theory, and therefore must be practiced side by side with that of weave structure, and it cannot be taught effectively except in connection with such practice. It will, therefore, be clearly seen that a systematic study of color is one of the very first things to be considered in the education of the textile student.

Digitized by Google

Textile chemistry, dyeing and printing, are also subjects of equal importance with either of the others just mentioned. No man possesses such power over matter as the trained chemist, and no feature of textile education is coming to the front more vigorously than instruction full, complete, and thorough, in this important branch. The average manufacturer of today knows but little concerning this department of his work, but one of the first duties that confronts him is to realize the tremendous significance which attaches to the application of scientific knowledge to the economic problems which under lie all forms of modern production, competition in which grows fiercer every day.

If the old methods had continued, the old knowledge would have sufficed; but the methods have changed, and are still changing, and we must change with them, or be left behind. Many of you who are here today can remember when the making of textiles was a village industry; when wool and cotton and flax were spun and woven by hand, and when the dye-pot on your grandmother's hearth and the sunshine on her lawn, represented well enough the agencies on which the ultimate charm of the fabric depended. To what an extent we have changed all that, it is not necessary to call your attention here, but I should miss the only point that I have tried to keep before us as the key to this whole discussion, if I failed to insist upon the truth that modern methods of manufacture are nothing if not scientific, and that no perfectness of organization; no specialization of duties and powers; no abundance of combined capital, or completeness of co-operation, can hope to succeeed except by the utilization of the last results of scientific investigation and the application of highly developed taste and skill. Now these results and this taste and skill are not to be had except through the agency of systematic and organized instruction, and as the light-house rests upon the rock, the textile industry of the days that are to come, will rest upon the solid and well ordered work of the textile school.

Digitized by Google

The PRESIDENT. Mr. FRANCE, I was very much interested in the clear division you made between the two grades of education, the trade school for the ordinary workman and the technical or college-grade school for the man who requires a higher standard of education. I would like to ask, sir, in your Philadelphia School, how many students you have coming under each of these divisions.

Mr. EDWARD W. FRANCE. In answer to Mr. MACCOLL'S query, I would say that we have been experimenting for some time along that particular line, trying to meet the requirements of the operative as far as it is possible, at the same time to meet the requirements and demands of the manufacturer, who wishes to have higher specialized skill than what the earlier training of the operative class would allow us to give; and we have been more or less successful by arranging a curriculum that would meet the requirements even so far as to taking up the early stages of arithmetic with some of the less learned operatives. We have some four hundred and some odd evening students. Of course, it is not to be expected that all such students are of the lower intellect — far from it. The superior man will always assert himself, and you must provide for him. Indeed there are many of the operatives who are of a very superior class, who have had a great deal of earlier education which prepared them for advanced work. It has been a very difficult problem in that direction, we have not finished all our experimentation, but I am quite satisfied that in such districts as we may perhaps call mill towns or where a certain industry is more advanced than any others and you cater for that, that schools, whether they be established in connection with the factory itself, or whether they be under the municipality or village government, should give such instruction as would allow the operatives to know something of the before and after processes, so that each man would know the damages that might be created by his neglect. That, in itself, appeals to us as being one of the fundamental things that should be taught to the operative class. Along that line I

Digitized by Google

understand schools have already been established, or are under way, one in Indian Orchard, and one in Utica where I understand they intend to try this same idea. Such schools can be made of no end of value, I think, to the manufacturers of those districts, if they will put their interest behind them.

I was very much impressed last night with the remarks of the ex-Governor of Rhode Island, when he came so forcibly to the front and said that it was the initiative that we wanted. Gentlemen, that is just the point, it is the initiative in each individual manufacturer, who shall see for himself that either the state or his industry or somebody in his community shall aid him in providing the kind of training that his operative cannot get in his mill. You all know that too well for me to need to express it. The experiments, as I said, have not been carried sufficiently far. In the earlier days of our school our instruction naturally took the same course day and evening. But experience has proved that you cannot carry it to the depth that you ought to carry it in the evening. Time and the qualifications of the average student will not permit.

Mr. EDWIN H. MARBLE. Mr. President, I would like to ask one question in regard to that. Does Mr. FRANCE find that many of the students are taking a special preparation along a special line of work? That is, for instance, to fit them particularly as spinners, or as card room superintendents, or for the finishing department?

Mr. EDWARD W. FRANCE. We find this, that the spinner from the manual part of the work cares very little to know anything about the machine running; he has gotten out of that. What he wants to know is how you get at the different sized material to draw it down to its size, and, therefore, that means that you have got to start most of them with the arithmetic part of the problem and then teach him by degrees the fundamental principles underlying the machine and the possibilities of that machine which he thinks he had previously mastered. Now, we

Digitized by Google

do not find that they want to be spinners, as spinners, they want to be master spinners, if that will answer your question.

Mr. EDWIN H. MARBLE. The reason why I asked that is, since yesterday morning, five different mill agents have asked me if I could put them on the track of men for one particular branch of the work, and one of them said particularly that he was unable to get from any of the textile schools men who were qualified except in a general way to fill that particular branch in his establishment.

Mr. EDWARD W. FRANCE. That, I think, was the point I tried to make quite clear, that the day student whom he would naturally appeal to the school for, was the man who was taking more of a general education in textiles, as your mechanical engineer would in this school (the Massachusetts Institute of Technology.) The night man, as I say, we have been experimenting along that line and have gotten very good results to provide the master spinner, which I presume is the man you speak of, or the master weaver, keeping him along these lines, and there is plenty of field for it. There is constant demand for boss weavers, so-called, overseers of weaving, overseers of spinning, overseers of dyeing, for which we cannot begin to fill the demand.

Mr. EDWIN H. MARBLE. In that connection, in Philadephia a short time ago that point was brought up by four or five of the carpet men requiring men for the finishing department of the carpet establishment. They were unable to find a man who knew anything except what he had learned in another carpet mill upon the principles of steaming and drying, shearing and finishing carpets for the market. It was such men as Mr. BROMLEY and Mr. IVINS who were in conversation on that same line. There seemed to be a remarkable scarcity of men available for those departments. They themselves had made no efforts to train such men, but they were trying to depend on an

Digitized by Google

outside source where there seemed to be no men available today.

Mr. EDWARD W. FRANCE. In a few words I will try and answer that question. Perhaps you are aware that the ingrain carpet industry is almost extinct and to fill the void the so-called printed tapestries are coming to the fore. That required a knowledge of the chemical part of the problem which none of those operatives had, and it made it necessary for us to expand largely in the chemical and dyeing courses to teach the difficulties of fastening a color for printing and making the paste for printing.

Mr. EDWIN H. MARBLE. Are there men taking that special course?

Mr. EDWARD W. FRANCE. Yes, sir.

Mr. ARTHUR H. LOWE. Mr. President, this seems to me to be a very important and very carefully prepared paper, and I want to suggest that the Secretary be requested to send a copy of it to each of the members of the State Board of Education and to each of the members of the Massachusetts Board of Commissioners on Industrial Education which was appointed at the suggestion of ex-Governor DOUGLAS. I think that this paper brings out some of the very points that they have had most difficulty with, that they have stumbled over more than others. I think the point that Mr. FRANCE makes that as the average of our employees becomes more and more ignorant, or at least more and more of the ignorant class become our employees, it is more and more important that we should have educated and trained overseers and superintendents. I think the paper is well worth that attention and I would suggest that the Secretary send a copy of it to the members of each of these boards.

Digitized by Google

RESOLUTIONS.

The PRESIDENT. Before proceeding with the next paper I will ask the Chairman of the Committee on Resolutions to submit the resolutions which are to be laid before the meeting.

Mr. FRANKLIN W. HOBBS. Mr. President, the committee have several matters to report on. In the first place, referring to the allusion in your address to the Atlanta Convention, we recommend the adoption of the following resolution:

Believing that much good has followed the conference held last year in Washington between the Cotton Growers and Manufacturers, we heartily endorse the plans for another conference to be held in the fall of the present year at Atlanta, and also call the attention of manufacturers to the opportunity that will be afforded at that time to visit the cotton growing states and by coming in contact with the planters, to bring about improved conditions in the handling, baling and shipping of cotton.

The committee unanimously recommend the adoption of this resolution.

The motion for the adoption of the resolution was made and seconded.

The PRESIDENT. Are there any remarks upon this resolution?

There being no remarks, the question was put to vote and the resolution declared adopted.

Mr. FRANKLIN W. HOBBS. Mr. President, those of the members who heard President PRITCHETT will remember that he referred to a bill which is now before the Massachusetts Legislature proposing to tax college property, and you will also remember his remarks in connection with the intimate relations between education and manufacture. The Committee on Resolutions, having that in mind, thought it advisable to recommend that Association take action on that matter, and submit the following:

Digitized by Google

In consideration of the close connection between education and manufacture it seems evident that any burden laid upon the one is to the injury of the other. Massachusetts has pursued the policy from the beginning of its history of encouraging education, and this policy seems eminently wise from the standpoint of the enlargement of its manufacturing and industrial interests, and any burden laid upon education in this Commonwealth may likewise be considered a burden upon the manufacturer. Therefore

Resolved that the present effort made in the Legislature of Massachusetts to tax college property* is against the interests, not only of education, but of industry and manufacture as well.

Resolved that the Secretary be instructed to send a copy of these resolutions to His Excellency the Governor and to each member of the General Court of Massachusetts.

Mr. JAMES P. TOLMAN. Mr. President, would it be wise to suggest that the words "of any sort" be modified to read, "for educational purposes?" Property yielding an income to a college is already taxed and I do not think there is any desire that that should be changed; but if "of any sort" should be stricken out, and replaced by the words "for educational purposes," it would more nearly, I think, meet our view.

Mr. FRANKLIN W. HOBBS. I think there would be no objection to that. The only answer to that is that President PRITCHETT drew this resolution, so that the committee thought undoubtedly it was correct. If advisable we can take out the words "of any sort." Possibly Mr. LOWE may have some knowledge on that subject?

Mr. ARTHUR H. LOWE. Mr. President, I have no special information on the subject. I think that the resolution, however, simply conveys the idea that no change ought to be made in the present method of taxing college property.

---

* As reported by the committee this resolution contained at this point the words "of any sort," which after discussion were stricken out.

Digitized by Google

Mr. JAMES P. TOLMAN. I withdraw my suggestion.

Mr. FRANKLIN W. HOBBS. We can leave out the words "of any sort," and it would not affect it, I think.

The PRESIDENT. You have heard the resolution as amended with the consent of the Chairman of the Committee on Resolutions. Is the motion seconded?

The motion being seconded, it was put to vote and the resolution declared adopted.

Mr. FRANKLIN W. HOBBS. The President of the Association handed the Committee on Resolutions a communication from the Cotton Manufacturers' Association of North Carolina, calling attention to resolutions which had been passed by that Association, relating to evils connected with the shipment of cotton, more particularly to delays after the bill-of-lading has been issued and to injuries through careless handling. With a view to co-operating in the purpose expressed by these resolutions we offer the following resolution:

Whereas, grave irregularities exist in the shipment of cotton entailing heavy financial loss and inconvenience to spinners, bills-of-lading being issued previous to the receipt of cotton by the railroads, omitting all car numbers and initials, rendering them useless for tracing or locating lost or strayed shipments, cotton actually remaining in some cases at initial place of movement two or three months being finally loaded, getting water soaked before being compressed and otherwise carelessly and negligently handled; demand drafts being promptly drawn on these incomplete bills-of-lading presented for payment to said spinners who are thus placed at great expense and loss in having to settle same two or three months before receipt of cotton.

Resolved, that the Board of Government be instructed to co-operate with other Cotton Manufacturers' and Growers' Associations for the purpose of bringing these grievances before the Interstate Commerce Commission to the end that they may be remedied.

Digitized by Google

Mr. WILLIAM D. HARTSHORNE. I move the adoption of this resolution.

The motion, being seconded, was put to vote and the resolution was declared adopted.

Mr. FRANKLIN W. HOBBS. Finally, the several votes of thanks, which we have incorporated into one resolution.

Resolved, that the National Association of Cotton Manufacturers extends its hearty thanks to the gentlemen named below for the interesting addresses and valuable papers presented at the 82nd meeting of the Association and that a copy of these resolutions be sent by the Secretary to His Honor, JOHN F. FITZGERALD, Hon. GEORGE P. LAWRENCE, Hon. WILLIAM C. LOVERING, Hon. GEORGE H. UTTER, Prof. ELIHU THOMSOM, Messrs. JOHN L. TATTERSALL, EVERETT W. BURDETT, WILBUR F. WAKEMAN, HARVEY STUART CHASE, HENRY K. ROWELL, EDWIN A. HARTSHORN, JOHN FOORD, G. A. GORDON, J. A. ALMIRALL, ADOLPH SUCK.

That in thanking the Boston Museum of Fine Arts for the privilege, not merely of examining, but also of making copies of exhibits in its extensive textile collection, this Association desires to call attention to the important purposes which such exhibits serve in a community, both as to the development of higher standards of taste in textiles and also affording to manufacturers some of the means of providing fabrics of improved design.

TO THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY, for its renewed hospitality in again giving the Association an opportunity to hold its meeting in Huntington Hall, we extend our thanks and take this opportunity of renewing our expression of appreciation of the work that is done in this Institution.

TO THE AMERICAN TELEPHONE AND TELEGRAPH COMPANY, the thanks of The National Association of Cotton Manufacturers are tendered for its courtesy in affording the privilege of complimentary long distance telephone service to members attending the 82nd meeting of the Association.

TO THE NEW ENGLAND TELEPHONE AND TELEGRAPH COMPANY, the thanks of The National Association of Cotton Manufacturers are given

Digitized by Google

for the courtesies of service placed at the disposal of the members during this meeting.

Mr. ARTHUR H. LOWE. In anticipation of the pleasure and profit which we are about to receive through the courtesy of the General Electric Company in escorting us through their River Works' plant at Lynn, and also providing other entertainment there, it seems to me most fitting that we should at this time give expression of our appreciation to that company by a hearty vote of thanks for their kind invitation and hospitality on this occasion, and I now move that such a vote of thanks be extended to the General Electric Company for the above mentioned courtesies.

The motion was seconded and carried.

EXCURSION THROUGH THE COTTON STATES.

The PRESIDENT. There is a matter here closely allied to the first resolution which was adopted, and I will ask the Secretary if he will kindly read this letter, which I think will be of interest to the members. It is from Mr. M. V. RICHARDS, of the Southern Railway.

The Secretary read a letter from Mr. M. V. RICHARDS, Land and Industrial Agent of the Southern Railway Company, Washington, D. C., which gave an itinerary for a special train for the European guests and others attending the Second International Conference of Cotton Growers and Manufacturers to be held at Atlanta, Ga., October 7, 8 and 9, 1907.

This itinerary contemplates that the train shall leave New York at midnight October 3, and reach New York on the morning of October 21. It provides for seeing Philadelphia, Baltimore, Washington, Atlanta, Birmingham, New Orleans, Galveston, Memphis, Chicago, St. Louis, Toronto and Niagara Falls, as well as some points of lesser note, visiting interesting portions of South Atlantic and Gulf States, the Mississippi Valley, and following the Great Lake Region and Lower Canada.

Digitized by Google

The total cost for the trip was stated to be approximately $226 per passenger on condition that there are one hundred or more participants.

Mr. WILLIAM D. HARTSHORNE. In order that this may come before the meeting, I move that this Association endorse this program substantially as submitted by Mr. RICHARDS of the Southern Railway Company, subject to such changes as it may be found necessary to make.

The PRESIDENT. You have heard this resolution. Of course we do not stand sponsor in any way for this excursion; it is purely an individual matter; but it affords an opportunity for members of our Association to visit the South and take part in the Atlanta conference, to meet the planters, and to endeavor to emphasize the improvements which are needed in connection with the handling of the raw material.

The motion was seconded, and being put to vote was declared adopted.

The PRESIDENT. We shall now proceed with the second paper on the program, The Whitin High Speed Comber, by Mr. ELWIN H. ROONEY, of the Whitin Machine Works.

Digitized by Google

THE WHITIN HIGH SPEED COMBER.

ELWIN HOLBROOK ROONEY, Whitinsville, Mass.

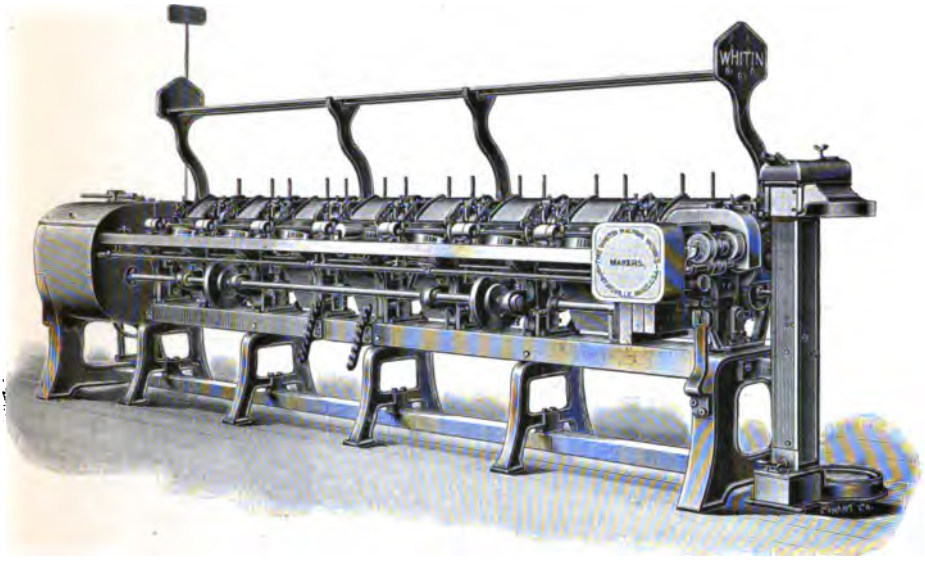
In presenting a brief paper descriptive of the new high speed comber manufactured by The Whitin Machine Works of Whitinsville, Mass., it is proper to say in the first place that it can only deal with the matter in a general way, as lack of space and perhaps your patience, would not warrant us in going into the details of all the improvements made on this machine. We wish, however, to pay particular attention to some features which have enabled us to present a machine that is revolutionary, not in its principle, but in the results which can be obtained from it. At the very outset we would call your attention to the fact that this comber which we are now presenting to you is, first and last, a Heilmann comber embodying the same Heilmann principles that have been used during the last half century and which has thus far stood the test of time. The same movements, the same principle of delivering the cotton, nipping and combing the tuft held in the nipper jaws and of forming the combed tuft into a web, — are found in this machine as in every Heilmann comber. The machine does not introduce new revolutionary ideas in the theory of combing, but is merely the outcome of our experience in the combing art, presenting the same old principles perfected, improved and simplified. In a word, it is the simplicity of this machine which is effected by new and novel arrangements which we think commends it to the manufacturer of today.

Digitized by Google

It is not out of place to first go back a little in the history of the development in the manufacture of combing machinery by The Whitin Machine Works. Up to 1897, all combing machinery used in this country was imported. The field, therefore, was an attractive one for American manufacturers and about this time they began to give the subject more or less attention. The first Whitin comber which we put on the market in 1899 was similar in its details to the type then manufactured and exported to this country by several well-known makers, it being our intention to present to the American manufacturers a comber which was well recognized and tried in principle. The success and appreciation with which this machine was received, gave us the encouragement necessary to lead us into the further development of the industry.

The standard comber at this time was a 6-head machine 8¾, inch lap, running at a maximum speed of from 85 to 90 nips per minute, the production being from 250 to 350 pounds per week depending upon the class of work desired. So great was the demand for combed cotton at this time and the machinery to produce it so expensive when compared with its product, that there was great call for improvements in combing so as to obtain a larger product per machine with no sacrifice in the quality of the work. Our first step in meeting this demand was to improve the cams, namely, to soften their action and reduce their throw, the result of which was to make it possible for a comber to run at 100 nips with even less vibration than at the previous speed of 85 nips. It is interesting to note at this point that while these cams were deemed at the time as being revolutionary and impracticable, as is ever apt to be the case with every new departure, it was only a very short time before we were selling to our competitors and the trade in general these cams to go on old combers of nearly all makes. This change in the cam marks an interesting period in the development of the comber as up to this point almost all manufacturers of combing machinery had given up the idea of obtaining a higher speed out of the comber, and to get production had turned to the use of a heavy lap.

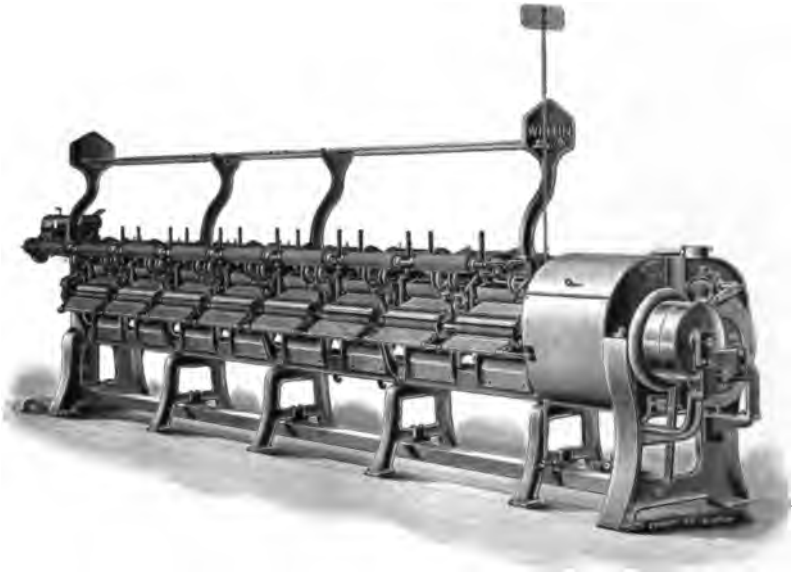
Digitized by Google



WHITIN HIGH SPEED COMBER, 1906. FRONT — FOOT END.

Our next step was to increase the number of heads on the 8¾ inch lap from 6 to 8. This was done in common with a number of other manufacturers at this time. The third step followed closely on the second and was the increase in the width of the lap. The progress of events was rapid and interesting at this time, as shown by an order which we took for a large mill in New England. Four months before commencing the delivery of the machinery our specifications for this mill read 256 6-head, 8¾ inch lap machines and we had not up to that time built anything different from this except the 8-head, 8¾ inch lap comber. These specifications were now changed to 160 machines, 10½ inch lap and inside of seven months we had designed and built a new comber and had these machines running in this mill. We attribute the unfailing success which these 10½ inch lap ma-

Digitized by Google



THE WHITIN HIGH SPEED COMBER, 1906. — BACK.

chines have had to the easy cam and the absence of vibration. The objection to the wide lap had been on account of the vibration in the machine, which largely prevented the long roll and the nipper jaws from holding the cotton sufficiently secure. This is a vital point in the construction of our new machine and one which must be taken into consideration with every comber where wide lap is used.

We have now come by gradual steps to the development of what we term our "high speed comber," having 8 heads and 12-inch lap, the floor space taken up by it being the same as the 8 head, 10½-inch lap machine, and the normal running speed 130 to 135 nips, our aim at all times having been to give a maximum production with first quality of work. This development proceeded along a different line from that of three or four other large production combers which have been brought out recently, among which may be noted the Montfort, Alsatienne and Nasmith, in, that while these get their production from

Digitized by Google

the use of a heavy lap, we obtain production with no increase in the proportionate weight of lap, but by increased speed of the machine. These various combers were carefully studied and after much thought we could not see wherein the gain which might be made in production by passing a heavy lap over a combing surface which remained practically the same as heretofore, even with the use of improved drawing-off mechanisms, would give the best results in the quality of the work, from the fact that you are decreasing the needling surface over which the cotton passes and to which it is subjected. The double nip comber we also passed over for the reason that while the same weight lap was used as on the single nip machine, yet the needling surface necessarily is reduced for two half laps in place of one, the rows of needles being reduced from 17 to 12 rows per half lap. We use in the new high speed comber the same feed gears, the same weight of lap, the same drafts with the exception of in the draw-box and the same mechanisms throughout, as what are found in the old style standard Heilmann comber.

In the early part of 1904 we began to experiment with ideas which we had in mind for a long time. These promised so well that the entire attention of our experimental force was devoted to the work on this new machine and the results were the patents granted to OSCAR L. OWEN, HARRY A. HASELDEN, TIMOTHY O'CONNELL, LEVI ROBINSON, DALLAS B. HATHAWAY and myself.

After exhaustive tests and experiments the first experimental machine was finished in July, 1905. The first machines sold to customers were shipped out in October, 1905, and since that time we have delivered to the trade something over 500 machines which are in successful operation in some of the best cotton mills in this country.

The machine as it stands today, using the same proportionate weight of lap, the same drafts, weight of sliver and percentage of waste, will produce about two and one-half times more combed cotton than the 6-head, 8¾-inch lap machine with which we first started out, with equal quality of work. In other words,

Digitized by Google

six of our new combers will produce nearly 90 per cent. more work than eight of the old style combers, occupying the same floor space: one operative running six of the new style combers will do the work of two running the old style machine. To sum up, — the new comber, costing much less proportionately, cuts in two the labor cost and floor space occupied by the old machine, the quality of work remaining the same.

Coming to the design of the machine: as before stated the arrangement of the feeding, nipping, combing, detaching and piecing operations is the same as in every Heilmann single nip comber. The principal variations are in the actuating mechanisms of the various operations whereby the same are adapted for safe and efficient operation at higher speeds than was possible in the older types. The results of these modifications or simplifications are to render it possible to run the machine at 130 to 135 nips per minute, with even less vibration than was before possible when running at 100 nips per minute. Experimentally this machine has been run at nearly 200 nips per minute for short periods of time to see if the vibration would have any effect upon the settings, which it had not. The vibration of the comber is overcome in the following ways:—

First. By eliminating entirely the customary rocking motion of the nipper frame and fixing the position of the frame in the correct position for combing, which, of course, reduces the amount of throw necessary for the opening of the jaws. This also allows us to drop the position of the feed roll proper so that much shorter staple of cotton can be used, as this brings the bite of the roll closer to the bite of the nippers and allows the combing of much shorter staple cotton than heretofore.

Second. The lifting mechanism of the top detaching rolls, consisting of the usual cams and connections, is eliminated, and the top roll is raised and lowered for piecing by a bevel on the cylinder shaft segment, this motion being much more positive and operating with less wear on the rolls for the reason that before, the roll was dropped with more or less of a shock on the segment, whereas now it is raised up gradually.

Digitized by Google

Third. A tension device is applied to the brass detaching rolls to prevent skipping and this overcomes any tendency of the brass roll to raise or skip its flute.

Fourth. The actuating mechanism of the lower detaching and piecing rolls is designed so as to use two notched wheels instead of one as heretofore, with their accompanying internal gear. One of these notched wheels is working through the movement of the actuating cam on the cam shaft, while the other notched wheel is resting, to take its turn the following nip, and so on. Also the speed of the cam shaft is reduced one-half by the use of double cams and the two notched wheels. In other words, for a cylinder shaft speed of 130 nips, the cam shaft is running at 65 revolutions, and each of the two actuating cams operating on its respective notched wheel situated on the notched wheel shaft is running at one-half the same speed in relation to the cylinder shaft as heretofore. Thus, to drive the drawing off rolls there are supplied two actuating mechanisms, each one of which runs at one-half the speed it formerly did with the same number of nips. This is the vital point in the new machine for the reason that here is eliminated that vibration which other types of machines have more or less ineffectually endeavored to avoid and which has prevented increase in speed.

These are the four principal changes in the machine. A number of other improvements have been found desirable as contributing to the simplicity of the comber, to the removal of moving parts, the prevention of fly waste and the improvement of work produced,—among which may be mentioned the following:—

First. The amount of combing surface is increased; twenty rows of needles are used on the half laps in place of seventeen, or there is an increase of nearly eighteen per cent. in the needle surface of the half lap. The top combs have no motion whatever, being set in a stationary position and at such angle that the needles project down and through the tuft more thoroughly than before. Their angle may be changed so as to help obtain any percentage of waste wished for. The effect of this is that

Digitized by Google

the top comb can be set closer to the cylinder and in such position that the cotton will pass through it more positively, with the resultant improvement in the quality of the combing. Formerly, the constant rising and falling of the top combs made necessary a much coarser setting, for the reason that the ends of the stop screws were apt to wear at the point where they came in contact with the segment.

Second. Electric stop motions of simple construction, easily understood and accessible, cover every point where there is likely to be a breakage of the sliver. A tell-tale signal immediately communicates the stoppage of the machine to the operative. By means of the stop motion the care of the machine is reduced to a minimum, as it is impossible for the sliver to break, or a roller lap to occur and the machine continue in operation. The operative is relieved from nervous care or worry, and the stop motion makes it possible for her to attend to a larger number of combers than heretofore. The electrical apparatus is the result of considerable thought, and we think is simple and well adapted for handling by the average mill operative.

Third. A waste packer consisting of a tin plate secured between the arms of the doffer comb presses down the waste so that two or three times as much can be packed into the waste box as formerly. This reduces to a minimum the amount of labor in taking care of these boxes and prevents the possibility of any waste working up over the doffer brush into the back of the machine.

Fourth. Whenever a machine is stopped for any length of time the pressure of the weights, if left on the detaching and draw-box leather covered rolls is apt to flatten the leather covering. To prevent this our machine is provided with weight-relieving devices which, when in operation, effectually lock the machine and prevent its being started.

One of the objections which has been brought forward against the use of the wide lap is the length of the leather covered roll. As stated before, the absence of vibration in the machine makes

Digitized by Google

it practicable to use a long roll. We furthermore use on the 12-inch lap machine a roll the same length over all and between bearings as was formerly used on the 10½-inch lap machine. All that has been done on this roll has been merely to lengthen out the boss, which has had the effect of strengthening the roll and making it stiffer.

The mechanical construction and finish of the machine has been given particular attention. The parts are highly finished, the gearing is all cut, the moving parts are covered by shields and covers and the head end is covered with a portable hood, which is easily removable and which, of course, keeps the head end gearing and cams free from lint and dirt. All parts are made from jigs and can be easily replaced by duplicates at any time should they be desired. By the absence of moving parts and the control of air currents the comber keeps free from lint and is easily cleaned. Change in the waste can be effected in from five to ten minutes and can be controlled between 12 to say 25 per cent. with absolute accuracy on appropriate grades of cotton. The change from one stock to another is readily made, practically no adjustments being necessary.

Other vital improvements in connection with the combing machine are found in the preparatory sliver and ribbon lap machines by the use of improved and patented drums, whereby we are able to use laps running from fourteen inch to sixteen inch diameter, thus being enabled to put fully double the amount of cotton on the lap spools. This insures the steady running of the comber with a minimum of piecings and labor attendance, and, of course, results in a greatly increased production in sliver and ribbon lap machines.

The above points in general cover the more important changes and modifications and all of these machines are fully protected by patents granted in this and in foreign countries.

The production capable of being secured depends upon the grade of cotton used and the class of work desired. Our recommendations range from 700 pounds on Sea Island to 1,000 pounds on coarse work.

Digitized by Google

In conclusion we would say, the success of this machine rests upon the fact that it has made no deviation from the theory and methods of combing which have been used for the past century and which have stood the test of time. It supports the belief that the principle of using a light lap and subjecting this light lap to a large combing surface is more correct than the use of a heavy lap with a consequent decrease in combing surface. To accomplish production it has simply increased speed and to obtain this increased speed it has eliminated vibration and simplified the operating parts. We are presenting to you a comber not new in principle, but simplified on sound basic principles. We believe we are following in the right direction and leave the verdict to that infallible judge — Time.

The PRESIDENT. Gentlemen, this may be said to be the first American cotton comb that has ever been produced, and we ought to have an interesting discussion in regard to it. Mr. ROONEY is a thoroughly practical man, and understands this comb from beginning to end, and can answer any questions which may be put to him.

Before the discussion, however, I will call on Mr. WALMSLEY for the report of the nominating committee.

REPORT OF NOMINATING COMMITTEE.

Mr. HERBERT E. WALMSLEY submitted the following report:

To the members of The National Association of Cotton Manufacturers : —

The nominating committee have attended to the duty assigned them and report the following nominations.

PRESIDENT.

WILLIAM D. HARTSHORNE, LAWRENCE, MASS.

Digitized by Google

VICE PRESIDENTS.

CHARLES T. PLUNKETT, ADAMS, MASS.
GEORGE OTIS DRAPER, HOPEDALE, MASS.

DIRECTORS FOR THE TERM OF THREE YEARS.

WILLIAM H. LOFTUS, NEWARK, N. J.
JOHN W. KNOWLES, NEW BEDFORD, MASS.
HENRY F. MANSFIELD, UTICA, N. Y.

DIRECTOR FOR TERM OF TWO YEARS.

EDWIN FARNHAM GREENE, BOSTON, MASS.

DIRECTOR FOR THE TERM OF ONE YEAR.

FREDERICK A. FLATHER, LOWELL, MASS.

Respectfully submitted,

HERBERT E. WALMSLEY,
W. E. PARKER,
ROBERT BURGESS,
WILLIAM L. LYALL,
Committee.

The PRESIDENT. Gentlemen, you have heard the report of the nominating committee. A motion is in order to accept the report.

Mr. ARTHUR H. LOWE, Mr. President, I move that the report be accepted, and that we proceed to ballot.

The motion was seconded and carried.

The PRESIDENT. I will ask the same tellers to distribute the ballots.

Mr. JUSTIN A. WARE and Mr. JOSEPH MERCER, the tellers named, proceeded to the discharge of their duty.

Digitized by Google

The PRESIDENT. While the ballots are being distributed allow me to suggest that we should proceed with the discussion of the paper on the Whitin Comb. I hope we will have some remarks and some questions asked regarding it.

Mr. JOHN H. ESTES. Mr. President, I would like to ask what is the shortest staple of cotton that has been experimented on with this machine?

Mr. ELWIN H. ROONEY. We are combing today ⅞ inch, one inch, $1\frac{1}{16}$ inch, and all the staples up to 1¾ inch.

The PRESIDENT. The shortest being ⅞ths?

Mr. ELWIN H. ROONEY. Yes, ⅞ths.

The PRESIDENT. Seven-eighths to 1¾ths.

Mr. ARNOLD B. SANFORD. Mr. President, I would like to ask the gentleman what width of lap he would recommend, 10½ inch or 12 inch. Also, if he sees any difference in the manipulation of the comber on Sea Island cotton than on Egyptian, and what lap he would recommend for Sea Island, if there is any difference between the cottons.

Mr. ELWIN H. ROONEY. I strongly recommend a 12 inch lap comber today. As stated in the paper, a few years ago there was considerable question about using a wide lap, but it was due, I think, to the vibration in the machine at that time, which is entirely removed at the present time. We were a little afraid of using the 10½ inch lap machine, for fear that the rolls would spring and the nippers not hold the lap firmly; but in getting rid of the vibration as we did, we have never had any trouble with the 10½ inch lap. Now, on the 12 inch lap machine, our rolls are of the same length as on the 10½ inch, with the exception that the boss of the roll is made longer, but over all, the roll is not any longer, and the weights do not spring

Digitized by Google

the roll any more on the 12 inch than they would on the 10½. So we believe firmly that we can hold and comb with a 12 inch comber as well and firmly as we did with the 8¾ inch, and strongly recommend it on all fine work.

The PRESIDENT. May I ask, Mr. ROONEY, what production you are getting with it in the mill in actual experience? I do not know whether you stated that in the paper, but perhaps you can tell in a general way on different kinds of cotton.

Mr. ELWIN H. ROONEY. We recommend two and one-half times the production of a six head 8¾ inch comber. For instance, if a man has been combing for years three hundred pounds for a six head, 8¾ inch lap comber, we will guarantee to do 750 pounds of equally as good work, because we do not pass any heavier lap over the needle surface at 750 pounds. The proportionate weight of lap is the same in our machine as it is in the 8¾ inch, and we recommend from 700 pounds on Sea Island to 1,000 pounds on a coarser grade of work. A great many of our combers today are running on Sea Island and staple cotton and they are running anywhere from 600 to 850 pounds per week.

Mr. JOHN H. ESTES. I would like to ask the gentleman if he finds any difference in the percentage of waste in a wide machine over that in a narrower machine?

Mr. ELWIN H. ROONEY. What comber did you say?

Mr. JOHN H. ESTES. Do you find any difference in the percentage of waste thrown out in a wide machine from that in a narrower machine?

Mr. ELWIN H. ROONEY. No, sir, we do not. That is due, I think, to getting rid of the vibration. Before, the old comber had in its detaching mechanism, a roll which was lifted by a cam and was dropped with a sudden shock on the segments of the cylinder, which made the piecing. It was almost impossible to

Digitized by Google

get that roll to drop in the same place twice alike. If it struck one end of the segment before it did the other, it would leave long fibres on one end of the nipper where it would not on the other. The piecing mechanism of our new machine is fixed, and the cylinder segment runs under the roll and raises it into position, so that it is a positive piecing machine and it draws the tuft away from the nipper very evenly and we get less long fibres in our Noils than ever has been produced in an old Heilmann comber for that reason. Another reason is that we use a longer draft. The longer draft that you use in a comber, the less of a tuft you feed in, consequently the less long fibres are there to be carried away by the half lap when it comes around.

Mr. ROBERT MCARTHUR. Mr. President, I would like to ask Mr. ROONEY in regard to the combing of the heavy stock. He says 700 pounds of Sea Island to 1,000 pounds of coarse work. I would like to inquire if this comber stops oftener on coarse work than it does on fine?

Mr. ELWIN H. ROONEY. No, sir, I do not think it does. It all depends upon the care that it gets. If the comber is taken care of under our instructions it runs just as well on the short cotton, on the coarse work, as it does on the long cotton.

Mr. ARNOLD B. SANFORD. I would like to ask Mr. ROONEY what rate of speed do you recommend for the best quality of work? You go from 85 nips on the old style to 100, then you say you are experimenting on 200 nips. Now, the question is, what do you recommend, for the greatest number of nips for quality?

Mr. ELWIN H. ROONEY. We are not experimenting on 200 nips; I think you misunderstood. We did run our experimental comber at 200 nips to test out the vibration in the machine, to see whether the settings would retain their position or not, which they did. But from 130 to 135 nips a minute is the speed that we recommend. Also on very fine work today

Digitized by Google

we are running the lowest rate of speed, 100 to 120. In combing Sea Island, where they are doing 600 pounds today, they are running the comber from 116 to 120 nips per minute, and it is very slow speed for it. I think the machine will run just as well at 128 to 130 nips a minute as it does at 118 to 120 nips per minute.

Mr. W. G. NICHOLS. I would like to ask Mr. ROONEY what he refers to by "coarse work"? Does he mean shorter staple or heavier weight in the lap?

Mr. ELWIN H. ROONEY. We have one mill that I have in mind at the present time which is combing Sea Island cotton 1⅝ inch staple, which is going into 20's yarn and they are combing over 900 pounds on that. What I mean by coarse work is of the quality of work desired. We meet a great many men today who say they do not care for quality, as long as it is combed, — what we could call semi-combed yarn and in that class of work we can readily do from 900 to 1,000 pounds a week. It does not make any difference what the length of the staple is. In fact, I think that staple cotton combs just as well as the short in coarse work.

Mr. W. G. NICHOLS. Is the production as great?

Mr. ELWIN H. ROONEY. Just the same on staple cotton as on the short cotton.

The PRESIDENT. Are there any other questions? If not we shall proceed with the next paper, Proposed System for Cleaning Machinery, by ROBERT SCHAELLIBAUM, of Providence, R. I.

The SECRETARY. Mr. President, I have received a telegram from Mr. SCHAELLIBAUM, that he will be unable to be here this forenoon, and asking me to read his paper, which is one of the most practical ones before this meeting.

Digitized by Google

PROPOSED SYSTEM FOR CLEANING MACHINERY.

ROBERT SCHAELLIBAUM, Providence, R. I.

Habits once established under certain conditions are usually maintained for many years after said conditions have changed and have been replaced by new ones, under which the old habits are no more suitable.

The stopping of mills on Saturdays for general cleaning is one of these. As long as every machine required one or more attendants, it was of course the proper thing to stop the mill, and have all the machines cleaned at the same time.

But consider the conditions of the present day. There is usually one attendant to three lappers, one to several cards, and so on. While one machine is cleaned, two or three other machines stand idle for no purpose, and the cleaning on the one machine could be done in half the time, if two persons were employed on it.

In many of the larger mills, extra hands are employed to go from one spinning frame to another helping at the doffing, so that the machines may be started as soon as possible again.

A similar plan should be followed for the cleaning of machines with a special team of help, for the weekly superfical cleaning as well as for more thorough cleaning at greater intervals, when rollers are taken out, cleaned, and thorough oiling is attended to.

Such a team of two or three persons would stop an opener or lapper on Monday morning for cleaning, and after finishing this start it up and stop another. After the lappers, they might go on with card room machines and spinning machines. Large

Digitized by Google

mills would have more than one team, and confine each to a certain group of machines.

For speeders and spinning frames, two teams could be combined, or there might otherwise be more help employed, as many as there is room for to work at one time, so that each machine would be stopped as short a time as possible. These teams would, of course, have to be taught by the overseer or second hand of each department, unless a man can be engaged to make part of the team, who knows the work.

People who attend to such work all the time would soon learn to do it quicker than other mill hands who do it only once a week, and some parts of the work only once in two or three months. On that account and as only one machine is stopped at a time, or in large mills at the most two or three, it would pay well to undertake the more thorough forms of cleaning more frequently than is common now, to the great benefit of quality of product and life of machines.

Worn out parts of machines, stuffed oil holes and other defects would be sooner discovered and attended to.

Under present conditions, the factory machine shop will usually be rushed with work on Saturdays, and on other days work is likely to be slack. With the system here proposed, the work of repairs would be more evenly distributed over the whole week.

With more timely attention to cleaning, oiling and proper setting of machines, break downs would happen less frequently, and if a machine had unexpectedly to be stopped for repairs, the team for cleaning would tackle that machine first, instead of some other, and unless the work on repairs lasts long, there would be actually no time lost on account of repairs.

In mills of such size that either one or two teams could not find constant occupation for cleaning, other work would have to be found for them part of the time. They might take the place of such as are absent on account of sickness or otherwise, and for this purpose the extra help would often prove very welcome. A man of the grade of second hand might find temporary em-

Digitized by Google

ployment in the machine shop, others on some other odd job that does not have to be done at any particular time.

It would certainly require some thinking and experiment to organize such teams to best advantage, according to size and conditions of each mill, but once the organization is accomplished, it would be of great and permanent advantage.

The PRESIDENT. We will proceed to the next paper on the program, Hot Water Heating by Forced Circulation, by Mr. J. A. ALMIRALL, of New York City.

Digitized by Google

HOT WATER HEATING BY FORCED CIRCULATION.

J. A. ALMIRALL, 281 Water St., New York City.

We all know that for mill and factory purposes there are practically three systems of heating in use, *i. e.*, air, steam, and water, in which the circulation may be obtained either by

First : — Differential pressure.

This is used in steam heating where advantage is taken of the physical fact that when steam is cooled its pressure is lowered and therefore a flow of steam results from the point of higher pressure to the point of lower pressure.

Second : — Circulation may also be produced, or assisted by using an outside source of power which is really "Mechanical Circulation." In systems of air heating, this circulation is produced by means of fans or blowers; in vacuum steam systems by means of a vacuum pump; in hot water systems by means of a pump to accelerate the flow of water.

As no doubt all of you are very familiar with the usual methods of steam and blower systems of heating for mill buildings, I propose to take up specially the last system mentioned above, that of *hot water heating by forced circulation.*

I shall not attempt any mathematical calculations but simply give a brief detailed description of the system, indicating a few of its possibilities and what has been actually accomplished.

Probably many of us know from experience that for ordinary house heating, water is the ideal method. Its heat absorbing capacity is far greater per unit of volume than any other available medium; it may be circulated at any desired temperature, thus providing variation in the temperature of the radiating sur-

Digitized by Google

face to suit varying weather conditions and heat may be stored in the water to be given up gradually when the source of supply is diminished. If these advantages made water an ideal system for a single building, it could only be supposed that some day one man would design the practical extension of a water system to larger purposes.

The idea of applying this system in such a manner first occurred to a Mr. QUIMBY N. EVANS, some seventeen or eighteen years ago and the first system of water heating using forced circulation where the only pressure carried on the system was that due to the friction load, was installed by him in a large court house building in New York and in the old original John Hancock Building of Boston. Those were the pioneer systems of *hot water heating by forced circulation*, and the methods and arrangement of apparatus for accomplishing these results economically were patented by him. This system has been very considerably developed and improved by Mr. EVANS and his associates, and like all good things, has been imitated and copied in later years by other parties with, however, the more important economical features covered by patent, omitted.

With this hot water system, the same general arrangement of coils and distributing mains is used as with a direct steam heating system. The coil pipes and mains are naturally larger than required with an ordinary high pressure steam system, so generally used in many cotton mills, but the distributing mains are considerably smaller than required with what is known as a "vacuum" or low pressure steam system. In any hot water system, there is a natural circulation due to the difference in temperature of the water in the supply and return mains. Where the mains are long and the difference in level slight, it is necessary to accelerate this natural circulation, and a pump is placed in the circuit. This pump insures, in all parts of the systems, no matter how extensive they may be, a positive and rapid circulation under perfect control. This circulating pump may be driven either by direct connected engine, steam turbine, electric motor or by belt from a line shaft.

Digitized by Google

Equally important to the circulating pump are the heaters for warming the water and this apparatus, consisting of two heaters and one pump or multiples of them for large plants, is generally located in the power house. (Cut showing typical plant layout.)

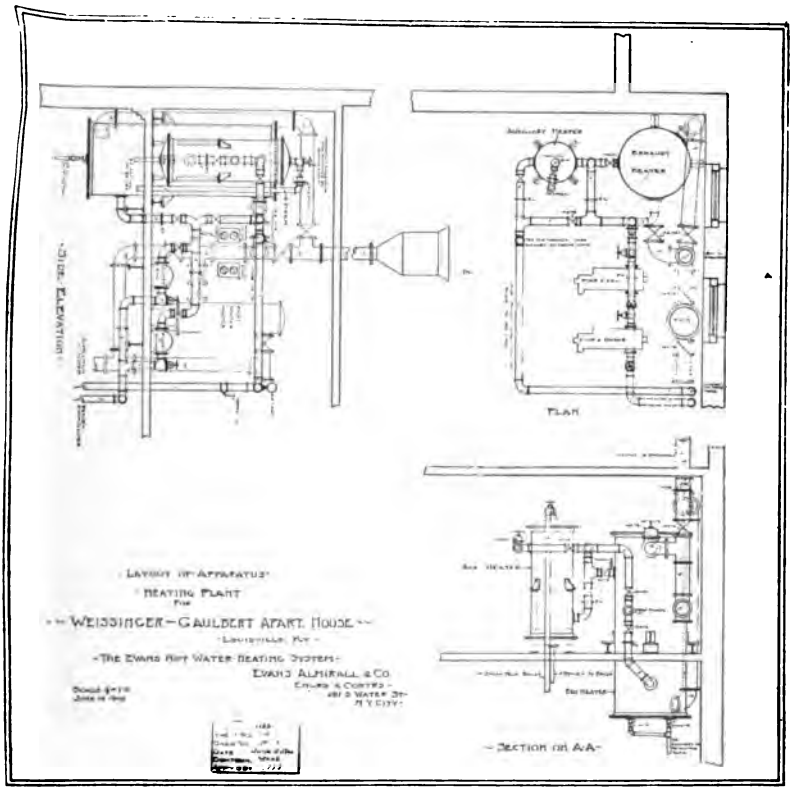


CHART NO. 1.

The heaters are two in numbers: —

First: — The exhaust heater is one through which the exhaust from the engine passes on its way either to the atmosphere or to the condenser. Briefly, this heater is similar in construction to a surface condenser or closed type of feed water heater and it may be built either with copper or iron tubes. The arrange-

Digitized by Google

ment of the tubes is such that the exhaust steam has a free passage through them and thence to the atmosphere (or when running condensing, to the condenser) so that absolutely *no back pressure* can be placed on the engine.

It should be understood that the steam spaces and the water spaces are entirely separate so that there is absolutely no mixing whatsoever of the water and the steam. In general, the water is circulated around the tubes absorbing through them the latent heat of evaporation in the exhaust steam and condensing it. This condensed steam can be returned to an open feed water heater or tank and *used again as feed water in the boilers.*

INGERSOLL-SERGEANT DRILL CO., PHILLIPSBURG, N. J.

In a condensing plant, this exhaust heater is placed preferably between the engine and the condenser, acting in the same way as described above.

In this manner the exhaust steam may be utilized and a vacuum maintained on the engine. The vacuum is varied as the atmospheric temperature varies; a lower vacuum being carried in colder weather in order to heat the water hotter and

Digitized by Google

correspondingly in warmer weather, a higher vacuum being carried when cooler water will give sufficient heat.

Second:—The live steam or auxiliary heater is similar in construction to the exhaust heater. This heater is especially for use when the available supply of exhaust steam is insufficient to warm the water to the required temperature as at night time or on Sundays and holidays when there is very little, if any exhaust steam available.

When this auxiliary heater is in use, live steam is taken direct from the boiler at boiler pressure and passed through the tubes of the heater where its latent heat is given up to the water which is circulated around the tubes. The condensation from this auxiliary heater can be returned directly to the boiler clean and at a temperature corresponding to the pressure. If the auxiliary heater can be placed high enough, the condensation is returned by gravity to the boiler and at other times, either a return trap or pump and receiver is used.

The above describes very briefly the essential features of the system and the operation is as follows:

The circuit will be considered as starting at the pump from which point the water passes, first to the exhaust heater absorbing at that point the latent heat from the exhaust steam and condensing it.

From the exhaust heater the water goes to the auxiliary heater where, when necessary, additional heat is supplied by live steam. The pipe arrangements are so made that water may be circulated either through each heater or around each heater, the valves being so arranged that in case of emergency, either heater can be cut out of service without interfering with the operation of the system.

Starting, then, from the live steam heater, the water is circulated through the flow mains which may connect either to one or more buildings as the circumstances require and the water then passes through the various coils or radiators in each of the buildings. The returns from these coils and radiators and several buildings, are joined together into one main return pipe which connects with the suction end of the circulating pump.

Digitized by Google

This completes the circuit, which is a *closed* one. That is a very important point because with the system, so arranged, then the static heat of water on the suction side of the pump is balanced by an equal static head of the delivery side of the pump.

The *only* work required of the pump is to overcome the friction due to the velocity of the moving water in the system of piping. The pump does not have to work against a static head of water in the system.

The piping system is supposed to be a tight one so that the same water is used *continuously*, being circulated over and over again and gives up just the amount of heat necesssary to heat the buildings at the proper temperature.

In the above, I have mentioned as the main sources of heat the exhaust and the live steam heaters, but it is quite possible in plants where large volumes of waste hot gases are available either from boilers, ovens, muffles or gas engines, to use such sources of heat to warm the water, either as the main source or as auxiliary to the exhaust steam.

In any case, however, it should be the subject of very careful calculation to show whether the amount of waste heat utilized will result in such a saving that interest, depreciation and a fair return on the increased cost of plant apparatus will be obtained.

I have in mind now one alkali plant of considerable size in Michigan where there were enormous volumes of very hot gases going to waste. Large economizers were installed and sufficient heat obtained, not only to take care of the entire heating system using this system, but also in sufficient quantities to warm the feed water for the boilers to about 300 degrees temperature.

This system is also being installed now in a small plant adjacent to New York City in conjunction with a gas engine power plant. The factory building will require about 400 H. P. of gas engine and arrangements are made for utilizing all of the heat in the jacket water and in the exhaust gases, practically 50 per cent. of the heat furnished the engine. Supplementary water boilers are installed for use at such times, as there will be insufficient heat from these waste sources, and for night time, holidays, etc.

Digitized by Google

The preceding gives rather briefly the special points of the system so far as the appliances and method of operation are concerned.

In any particular system, however, the advantages to be gained by its use constitute the most important consideration to be kept in mind when investigating its merits. These points of superiority are as follows:

This system utilizes the exhaust steam of non-condensing engines causing absolutely no back pressure on the engines, under any condition of operation. The exhaust pipe is always open free to the atmosphere; no back pressure valve is used.

This is evidenced by indicator cards from the engine showing the same atmospheric line with and without the heating system in operation and this is a claim that cannot be generally substantiated for any other system of heating.

This system stands *alone* in this point — that it absorbs and utilizes the latent heat in exhaust steam on its way to the condenser. It is the only system by which this heat, otherwise thrown away in the condenser overflow, can be utilized.

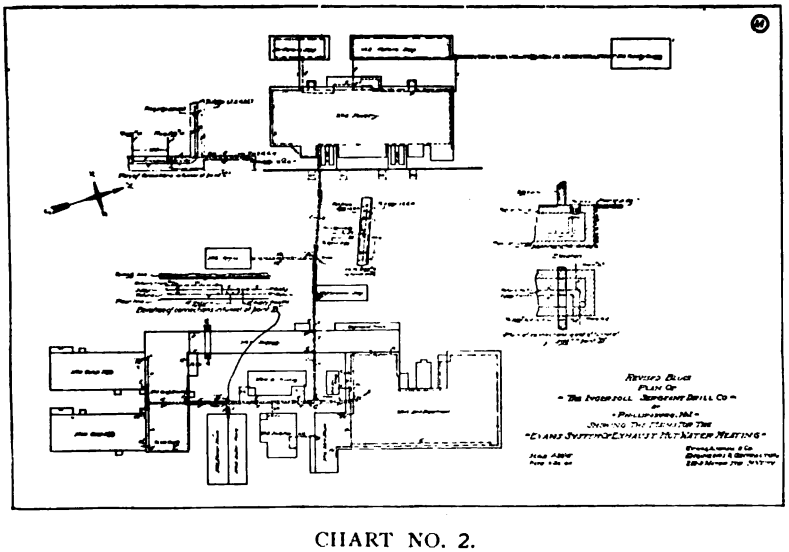


CHART NO. 2.

Digitized by Google

In all systems the heating surface is proportioned to obtain the guaranteed temperature with minimum temperature outdoors and all surface in use. Minimum weather occurs for a few days only during each winter, therefore, during most of the heating season, in order to avoid waste and overheating, either the heating surface must be closed off, or the temperature of the heating medium reduced.

Experience shows that the radiation will *not* be closed off, but windows and doors opened to allow the escape of excess heat, as with the steam system it is not very feasible to control temperature of the heating medium.

This system is the *only one* in which it is possible to reduce and proportion the temperature of the circulating medium to suit the varying weather conditiohs.

The temperature of the circulating water may be maintained within a few degrees of the temperature of the exhaust steam heater on its way to the condenser. The temperature of the exhaust steam depends upon the degree of vacuum and the maximum vacuum can be maintained which will just give the necessary temperature to the circulating water.

It is frequently found that in heating systems, *even in moderate weather*, the amount of exhaust steam available is not sufficient to *entirely fill* all the main and connecting pipes and reach the radiation farthest from the power house.

This requires the addition of live steam simply to *fill the system* and obtain steam at the extreme ends, although this live steam would not *actually* be required for heating purposes were it possible to evenly distribute the smaller amount of available exhaust steam throughout the entire system. In steam systems, pressure reducing valves are always used and they automatically open to admit live steam, as soon as the exhaust steam fails to completely fill the piping system.

This occurs at times, due to the variable load on the engine. When the engine load is light, the exhaust steam from the engine will not fill the heating system and live steam is introduced through the reducing valve simply to maintain the pres-

Digitized by Google

sure constant. When the engine load is heavy and more exhaust steam is given off than is required to fill the system, the back pressure valve opens and allows the excess of steam to be wasted to the atmosphere.

In the water system, the conditions are entirely different. With the large exhaust heater *all* the exhaust steam *independent of variation* of engine load can be condensed up to the limit of the capacity of the heater. In this manner, the heat of the surplus steam from the engine during the period of heavy load, is stored in the water. During the period of *light load*, this surplus heat is given off, the temperature of the water being slowly lowered until the heavy load returns again and restores the water to its normal temperature once more. *No live steam* is used during the period.

If the amount of exhaust steam continuously available is *small*, it warms the water to *some* temperature and the heat from even this little exhaust steam is *evenly distributed throughout the entire system.* It may be said to be spread out thinly.

Live steam is not automatically turned into the system until a higher temperature of water is required throughout the entire plant for satisfactory warming of the buildings.

The above is one of the very strong points of the water heating system and that is its ability to take a small amount of exhaust steam and distribute it evenly throughout an entire heating system. It is one of those points which cannot be demonstrated by actual scientific calculation as such calculations would theoretically demonstrate the impossibility of what in practice is actually accomplished by the water system.

Sundays, holidays and nights, when no exhaust steam is available and the heating must be done entirely with live steam, the same conditions prevail. A small amount of live steam can be distributed throughout the entire water system, whereas with a steam plant, enough live steam must be furnished to entirely fill the system and reach the farthest coils or radiators.

When all exhaust steam is used, should it prove insufficient, then and not until then is live steam used. Live steam may

Digitized by Google

then be turned into the auxiliary heater either by hand or automatically in such quantity only as may be required to obtain the desired temperature in the circulating water.

Because it is impossible to govern exactly the temperature of water required, less live steam will be used than where it is necessary to maintain with a steam system 212 degrees throughout the entire plant. Exhaust and live steam are used in independent heaters and never mixed.

The water system is easiest to regulate also because the engineer in the power house has perfect control of the temperature in the entire plant. The temperature of the water can be raised or lowered at will to suit the outside temperature, and so maintain an even degree of heat throughout the system. When it is desired to shut off the heat in any room, the operation of one valve is necessary and even then, the absolute closing of the valve is not essential. In steam systems, unless the controlling valve is closed tightly, water fills the radiators or coils and "hammer" results.

In some so-called "vacuum" steam systems, an attempt is made to avoid "water hammer" by the application of "automatic" devices, at each radiator or coil. These "automatic" devices, however, must receive constant and careful attention or they will not continue "automatic." Then trouble and failure follow. This entails a double expense for attention and repairs.

With the water system, no such devices are required or used, as no noise of "water hammer" is possible.

Any number of buildings may be heated from a central plant. By means of the forced circulation, the mains can be carried any distance either above or underground, from building to building and thus the heat generated at a central point distributed evenly wherever desired.

In any heating surface, power is required to move the heat (in whatever form) from the power plant to the radiating surface. The water system requires less power for this purpose than any other system.

In steam heating, in order to produce circulation, a difference

Digitized by Google

CHART NO. 3.

in pressure is required between two points. Either back pressure above the atmosphere must be placed on the engine, or a vacuum pump must be connected to the return pipe to pull the steam through the system.

Placing back pressure on the engine *reduces the available power* and *increases the steam consumption* per horse power of the engine.

With the vacuum pump cold water must be injected into the return pipe at the pump to supplement the condensation of the heating surface and this reduces the final pressure and tempera-

Digitized by Google

ture of the condensed steam. The water produces the vacuum and the pump removes the products.

The waste of the cooling water and the cost of running the pump are both chargeable to the heating system. Such a vacuum pump requires *many times* the *steam consumption* necessary to drive the circulating pump of a water system.

Another very important point in favor of the water system is the fact that no attention need be paid to the grade of the flow of the supply mains. The return mains may go overhead alongside of the supply mains. Trenches or conduits in the basement of buildings are unnecessary, and all pipes of the entire system are always in view and accessible.

In any steam system, pipes *must* be drained in a given direction and the returns kept below the lowest radiation, requiring trenches and thus hiding the pipes and making them inaccessible.

The size of pipe required for the distribution of heat in the water system is much smaller than in any low pressure steam system of equivalent capacity.

The PRESIDENT. We shall now proceed with the last paper on the program and a paper of great interest and importance, on Reinforced Concrete Construction Especially Applied to Mill Use, by Mr. ADOLPH SUCK, Mechanical Engineer, of Boston.

Digitized by Google

REINFORCED CONCRETE CONSTRUCTION ESPECIALLY APPLIED TO MILL USE.

ADOLPH SUCK, Mem. Am. Soc. Mech. Eng., Boston, Mass.

This subject is an important one, and of such interest to all who contemplate the erection of buildings at this time, that it is not possible to mention in this short paper all the points of interest and value that this subject demands.

By many, reinforced concrete construction is considered a fad but present day conditions have demanded this type of construction, and it has long since passed the stage of experiment. Reinforced concrete, if properly designed and erected, is stronger and better than any known building material, whether brick, stone, or iron, and a large number of buildings constructed of this material bears out the statements of its adaptability to any use. While this country has not progressed along these lines to the extent that foreign countries have, we have made considerable strides, and there is now no state in the Union without buildings of this class.

Most of the opposition to this form of construction comes from architects and contractors who have no knowledge of it. Up to the present time very few contractors are able to figure on concrete buildings and many large mill contractors instead of competing with other contractors in this line urge the construction of buildings with which they are familiar.

Few architects are now able to figure and design the reinforcements for these structures and, as would be expected, advocate a form of construction with which they are familiar and condemn the types that they are not capable of handling.

Digitized by Google

Some of the conditions that have brought about the erection of buildings from this material, and which are forcing mill owners to consider its merits are: —

1st. The cheapness of the cement, due to its increased production within late years.
2d. The scarcity of timber.
3d. The increased cost of labor.
4th. The question of insurance.

CEMENT.

Cement, one of the chief ingredients used in concrete construction, can be and is now manufactured at a profit in nearly every section of the country, 40,000,000 barrels of cement were used in construction work last year against 17,250,000 barrels five years ago. This increased demand and production, together with improved manufacturing processes has brought the cost of this material to a point where buildings constructed of it can be erected to compare favorably in cost with buildings constructed of other material. Further reductions in the cost of cement, which will come with the growing demand and production, will considerably reduce the cost of concrete buildings that will be built in the future. As cement is now produced in many different sections of the country from varying raw material, it of course varies in its different essential qualities. Each lot of cement used in the construction of a concrete building should be put to a critical test to determine its resistance to crushing and for impurities that rob it of its value for this purpose.

TIMBER.

The timber that is used in mill buildings and large structures, is that known as long-leaf hard pine, and you all know that this is getting scarce. The cost of heavy timber, suitable for mill purposes, is in the neighborhood of forty-five dollars ($45.00) per thousand, and even at this price, it is often impossible to secure a suitable stick and its scarcity is becoming more notice-

Digitized by Google

able as each season advances, and within a short time, other materials must be used in the construction of mill buildings.

LABOR.

The scarcity and increased cost of skilled labor makes it very expensive to erect factory buildings today out of brick and timber. Consequently, a substitute had to be found that would decrease the cost. This has been found by a few pioneers and will, in time, be realized by all, to be in reinforced concrete construction. Reinforced concrete construction requires very little of the skilled labor that is used in handling other building materials, as a great deal of the work is done by machinery and unskilled laborers.

INSURANCE.

Steel and cast iron are not strictly fire-proof materials but there is no question about the heat resistance and stability of reinforced concrete buildings when properly built. Buildings of this class require no insurance, it is necessary only to insure and protect the contents of these buildings, and even if the contents of a properly constructed reinforced concrete building should be totally destroyed by fire, the building will remain intact and practically undamaged.

A reinforced concrete building is constructed of cement, sand, broken stone or gravel, and steel.

SAND.

The sand that is used, should be free from loam or vegetable matter, and should be clean and sharp. Great attention should be paid to the quality and kind of sand that is used, as upon this depends the stability of the structure.

BROKEN STONE OR GRAVEL.

In structures of this kind, it is preferable to use broken or

Digitized by Google

crushed stone, but when such is not readily obtainable, good screened gravel makes an excellent substitute. The broken stone should be in various sizes, so that they will compact well together. When the sizes are not properly blended, it will require an excess of cement and sand to fill the voids between larger stones, and in consequence increase the cost of the structure. Great care should be taken in selecting material of the proper size, to use in the various members of the structure. For thin walls and light beams of short span, fine broken stone or gravel should be used. Larger members require larger stones or gravel, and in foundation work and unreinforced places, stones two inches or more in diameter can be used. At the same time, and in all cases, stones of smaller sizes should be used to fill in the voids between the larger ones.

STEEL.

The steel should be mild steel, of a quality to allow for cold bending of 180 degrees around its own diameter. It should pass suitable inspection before it is used. The sizes depend upon the design of the building, and the work it is called upon to perform under the varying conditions of strain that it is subjected to in various parts of the building.

DURABILITY.

We know that Portland cement concrete, continues to increase in strength with age. Experiments have shown the increase in strength up to two years of age. It is possible that it continues to gain strength after that length of time, but no practical experiments has given us data on this point. It may take a thousand years, it may take five thousand years for it to lose its value as a sustainer of the loads that it was originally designed to carry. Concrete withstands the weather, and requires no painting or repairing.

ERECTION.

The speed with which buildings of this character can be

Digitized by Google

erected is sometimes of the greatest advantage. The labor and the greater part of the material can, in most cases, be obtained locally. Great speed can be attained if the contractor has the proper machinery and organization. A great part of the cost of erecting a concrete structure is for the wood forms. In a properly designed building these forms can be used over and over again, which not only saves on the cost of the building, but allows more speed in the erection. At the present prices of lumber, the cost of the forms is heavy and the engineer of concrete construction must economize the centering material in his design so as to make repeated use of each piece. This can be easily accomplished where a building is largely a repetition of parts.

A great deal depends upon the correct placing of the steel and pouring of the cement. The size and position of each bar of steel is determined by elaborate and careful calculation by the engineer and an experienced inspector should be employed on the works to see that the design is rigidly followed.

In some cases the columns, beams and floor slabs are cast on the ground and erected as you would structural steel. By this method, three sides only are required for the moulds and speed is sometimes gained in erecting the structure on account of not having to wait for the material to harden in one course before the form can be taken down to begin the next one. In other cases, it is advisable to mould the members in position in the structure.

STRENGTH.

There is hardly a limit to the carrying capacity of this material. The writer has designed several buildings where the floor carries a live load as high as 3,000 pounds per square foot, with a large factor of safety; the main girders being 30 inches wide by 57 inches deep.

Figure 1 shows the ruins of a so-called fire-proof building. In all probability, if this building had been of wood construction the damage to the machinery would not have been so great.

Digitized by Google

FIGURE 1.— RUINS OF A WOOLEN YARN MILL.
Illustration from "Der Eisenbetonbau."

Falling of floors, twisting of steel and water coming through the floors generally causes the greatest damage. In a concrete building you have none of these features. The floors and beams above will not burn. Fire on one floor cannot travel to the floors above or below. Fire on one floor of a concrete building will not bring down the machinery above, neither will the water used in putting out a fire on one floor damage and destroy the machinery and material on every other floor below it, as is the case with any other type of construction.

As the question of details varies with each design, I have chosen as an example a building lately designed and constructed and which is illustrated in Figures 2, 3, 4, and 5.

These figures are chosen to give an illustration of a building designed by the writer.

Digitized by Google

FIGURE 2. — WOOD FORMS IN PLACE, READY FOR STEEL AND CONCRETE.

FIGURE 3. — POURING OF CONCRETE.

Digitized by Google

FIGURE 4.—INTERIOR OF COMPLETED BUILDING.

In this view, you get an idea of the large amount of light obtainable, the building is 72 feet wide and only 14 feet from top of floor to top of floor.

This building was designed and built for the United Wire and Supply Co., of Pawtucket, R. I., and a glance at the illustrations will show how easily a building of this class can be adapted to textile mills.

The model before me is an exact duplicate, on a small scale, of the building at Pawtucket and shows the details of construction of a reinforced concrete building; also the relative positions of the steel and concrete.

The Textile World Record of March gives full details of this particular building.

As this country can boast but few textile mills of this type, I have had included in this paper plates showing illustration of mills built in Europe.

Digitized by Google

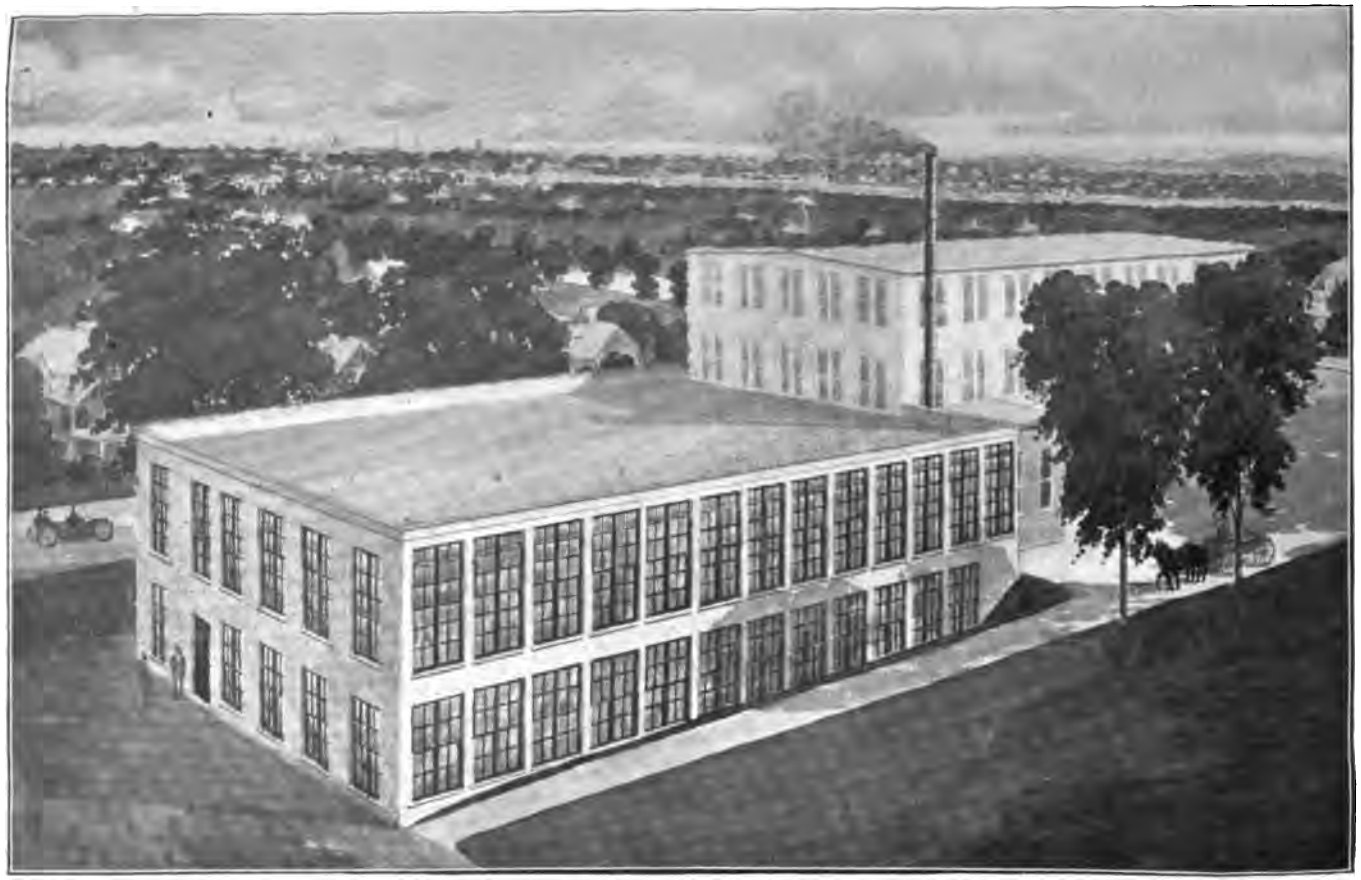


FIGURE 5.—EXTERIOR VIEW.

Digitized by Google

FIGURE 6.—INTERIOR OF A WORSTED SPINNING ROOM. (FINLAND.)

Illustration from "Der Eisenbetonbau."

FIGURE 7.—SECOND STORY OF SAME MILL SHOWING LONGITUDINAL STIFFENERS.

Illustration from "Der Eisenbetonbau."

Digitized by Google

FIGURE 8.—LOWER FLOOR OF A TWO-STORY MILL.

Illustration from "Die Eisenbetonbau."

The drops shown on the beams, are to support the main drive hangers, which are to be bolted to the sides.

Digitized by Google

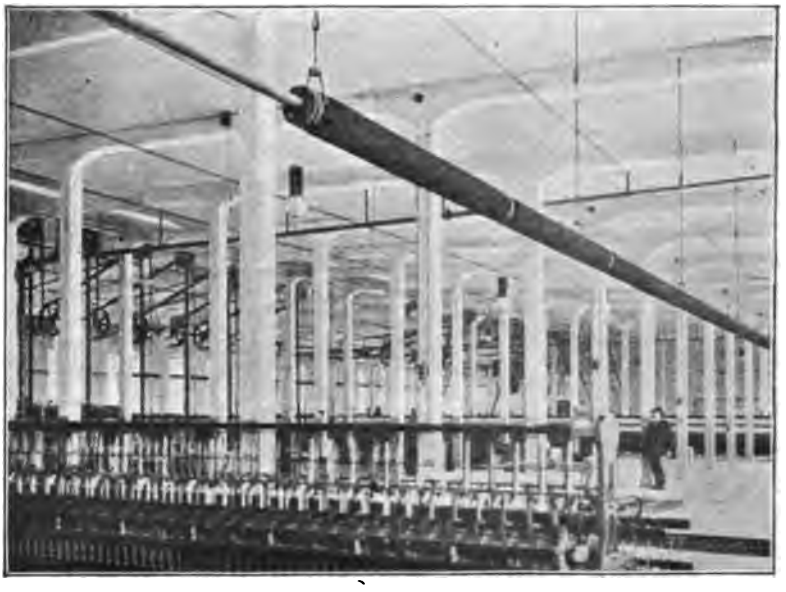


FIGURE 9.—SECOND STORY OF THE SAME MILL; NOTICE THE LIGHT STRUCTURE.

Illustration from "Der Eisenbetonbau."

VIBRATION.

Mill owners know of the great vibration in textile mills; especially in a weave mill. The question has been asked during the past years, what effect this continuous vibration will have on a reinforced concrete building. In answer to this question I will answer "There is none," as the whole structure will take up the vibration that originates in any particular member, transmitting it throughout the entire structure equally, because of it being monolithic. In other words it is as if it were hewn from a solid block of granite and each vibration must travel through

Digitized by Google

and be lost in the counter vibration and in the rigid portions of the structure. A building at Portsmouth, N. H., designed by the writer, is every day receiving one of the severest tests of vibration. This building is used for drop forging, having four hammers of five tons capacity. When these hammers are working one can feel the ground shake blocks away, and yet the building today shows no single sign of the effects of the vibration. A brick building, under these same conditions, would have to be replaced within a short time, and would call for continuous repairs.

ECONOMY AND COST OF CONSTRUCTION.

The item that appeals to all mill owners is the cost. The cost of labor, steel, cement, sand and stone is of course determined locally and is a large factor in the cost of the building. From 25 per cent. to 30 per cent. of the cost of a concrete building is in the wood forms and therefore the cost of lumber has to be considered, yet with a proper design, the same lumber can be used over and over again and a great saving made on this item.

A reinforced concrete mill building can be built at a profit to the contractor for about ninety cents to one hundred cents per square foot for each floor of a building three stories high; of course the higher you go the less the cost per square foot.

ADAPTABILITY TO TEXTILE MILLS.

As I have said before, this country has been slow to adopt this form of construction. We have been fortunate, in years past, in having at our doors an abundance of cheap and good building material and it has not been found necessary to depart from time-honored methods. We have now reached the end of our cheap material and must find a substitute and at the same time improve our factory buildings. Our fire risks are great and can only be lessened by the use of this strictly fire-proof material. The troubles and losses arising from a leaky steam

Digitized by Google

and water pipe, floor scrubbing, tipped over fire pails and oil tanks and the hundred other annoyances due to water or oil going through the floors are eliminated in this type of building. Shafting will not be continually getting out of line. The annoyance of static electricity will be overcome, as there are no openings around the window frames and leaky walls to admit the dry and frosty air. The mill can be lit and ventilated as in any type of building. There are no hiding places for rats and vermin, neither can there be oil-soaked and water-soaked floors. There are no rough and uneven walls and ceilings to act as dust catchers and slug producers. In fact no safer and cleaner type of building can be had for textile purposes.

Mr. ADOLPH SUCK. Before closing this paper I wish to say that just beyond Copley Square, on Irvington and Harcourt streets, is now under construction a large four-story concrete building, designed by the writer, and just now the building is in a very interesting state of construction and the reinforcing steel is in place for the first floor. I would be glad to have any gentlemen who are interested examine this building before they leave the city, as I think it will be very interesting to them. [Applause.]

Mr. WILLIAM D. HARTSHORNE. Just one or two questions I would like to ask. I did not notice any reference to expansion and contraction joints. Are they taken care of by the reinforcing?

Mr. ADOLPH SUCK. I have found that expansion joints were only required about every fifty or one hundred feet. If enough steel is put into the building you require no expansion joints, but it is safe on a very large mill building to use expansion joints, putting them in every fifty to one hundred feet.

Digitized by Google

The building will not crack to any great extent to damage or injure it. There will be merely a series of small cracks, that are called hair cracks, which will be hardly noticeable unless you are looking for them.

Mr. GEORGE OTIS DRAPER. I should like to ask Mr. SUCK whether he intends that this form of construction should be adapted to spinning and weaving rooms with these concrete slab floors, without any wood covering for the help to stand on; that is, whether the help are to walk up and down on this hard concrete.

Mr. ADOLPH SUCK. There seems to be an opinion that with a concrete floor it is harder on the feet than a wooden floor. A certain weight is transmitted on the floor; resistance has to be given from the floor to carry that weight, so that there cannot be any weight given except the energy that is put on by the person walking. A concrete floor does not vibrate and the only cause that they have of saying that it injures their feet is the unevenness, formerly of stone floors. If you walk through a concrete constructed mill building, where the granolithic floor is laid even you find none of that effect that would injure the help from walking. Time will show that the statements of some of the constructors are right, that a granolithic floor is not harder to work on than a wooden floor.

Mr. WILLIAM D. HARTSHORNE. Mr. President, there is one more question, if I may be allowed, with reference to this question that Mr. DRAPER has asked. In case there is no wooden floor, such observations as I have made indicate that where these little fine cracks occur that are spoken of, there is a continual breaking off and a dust is formed which is apt to be distributed through the room. What provision can be made to take care of that?

Mr. ADOLPH SUCK. I find that is due, in floating the granolithic making too thin a coat. When floating the coat the small

Digitized by Google

particles of cement float to the top and do not adhere. You find nothing of that sort in granolithic sidewalks and if a mill floor is laid with the same care that you would lay a sidewalk you would not have that trouble. I must say that I have had it in some of my buildings, but that was due to the laying of the granolithic floor.

Mr. ALBERT FARWELL BEMIS. Mr. President, it seems to me that with those granolithic floors, providing no wooden flooring is put down, this dust is sure to be present to some extent, as Mr. SUCK says in the case of his own floors, that it does occur to some extent. I would like to ask whether that dust, which will almost surely arise, will be injurious to the machinery.

Mr. ADOLPH SUCK. I do not believe it will be injurious, and I should advocate in a mill for finer goods, a light maple top flooring on top of the regular cement floor; but in ordinary factory work I should not advocate a top floor. It is only in the finer grades that I should put it in some parts.

Mr. ROBERT MCARTHUR. I would like to inquire of Mr. SUCK how he would secure the machinery in textile mills from vibrating?

Mr. ADOLPH SUCK. There are several ways of securing the machinery. There is a way of holding it down with expansion bolts. In some places we build a frame about an inch high right around the machine and fill that right in with cement, that holds the machine more strongly and rigidly than any other way.

Mr. ROBERT MCARTHUR. In case of a machine that vibrates very much would it be desirable to bolt it?

Mr. ADOLPH SUCK. Yes, I should then fasten it down with bolts; but in a cotton mill, where you very seldom change, and intend to lay down a top floor, I should lay cleats, or long strips

Digitized by Google

of wood, bury them right in the concrete to which you can bolt the machines down.

Mr. LOUIS SIMPSON. I would like to ask the speaker, Mr. President, about those expansion joints that you were speaking of, are they required on the wall on a large building?

Mr. ADOLPH SUCK. Yes, we require those in the walls of a large building, and also through the floors. Sometimes we make them through the centers of the span or bay and sometimes right across the top of the beam.

Mr. LOUIS SIMPSON. Then what description of expansion joints, would you make?

Mr. ADOLPH SUCK. We would make practically two buildings separate; build one building right up to it, and then leave a space of a quarter of an inch and start the other up alongside there.

Mr. LOUIS SIMPSON. Some years ago I built a big power house of concrete. It was not reinforced. The wall must be nearly 190 feet long, and I found no need whatever for any expansion joints. It has been built now ten years, and there is no sign now, of need of expansion joints. I am asking this question because I am a believer in reinforced concrete and I know that many architects and engineers who have not studied the art are raising all kinds of absurd objections to it.

Mr. ADOLPH SUCK. Yes.

Mr. LOUIS SIMPSON. I was told yesterday that some architects in Philadelphia had been raising the bugbear of cracks and expansion, and everything of that sort. I do not think myself that in an average sized mill building there would be any need at all of expansion joints in the wall.

Digitized by Google

Mr. ADOLPH SUCK. I must say your building there had very heavy walls.

Mr. LOUIS SIMPSON. Yes.

Mr. ADOLPH SUCK. In the buildings they are building now of reinforced concrete the walls are only four inches thick.

Mr. LOUIS SIMPSON. Yes.

Mr. ADOLPH SUCK. I have just designed a paper mill in New Bedford, where we had a wall 27 feet high, 8 feet bays, and 4 inches thick. The owner said he thought surely the wall would come down, and I had better increase it to eight inches. After the wall was up he wanted to know whether I could not build the rest of the wall two inches thick.

Mr. LOUIS SIMPSON. In any wall of that descripiton don't you have trouble during the winter with condensation on the outside?

Mr. ADOLPH SUCK. Yes.

Mr. LOUIS SIMPSOM. My idea would be to build the piers and beams only of reinforced concrete and then to fill in between the beams and the windows with hollow cement blocks, then you do away with all the trouble with your cracks and you also do away with your condensation.

Mr. ADOLPH SUCK. Yes, but then you can build a concrete building with an air space. You can build a four inch wall and there is only about three feet distance between the floor and the window sill which would have to be filled, that could be filled with two inch wire lath and plaster partition, leaving any desired air space, preferably two inches, between the two walls. This would prevent condensation.

Mr. LOUIS SIMPSON. Yes, but you can have three or four air

Digitized by Google

spaces if you use some of these blocks. They are not all made with one space, but some are made with two, and you can go as far as four or five, if you like. That is my idea of the best factory building, using reinforced concrete to carry the weight.

Mr. ADOLPH SUCK. Then your building is liable to a great deal of vibration and your vibration is not distributed to every part of your building, it would not be distributed through the blocks.

Mr. LOUIS SIMPSON. No.

Mr. ADOLPH SUCK. It would have to be taken up by the framework; just as though you built the building on a steel frame, and filled in the bays with brick.

Mr. LOUIS SIMPSON. Certainly, and if you had them strong enough I believe it would be just as good for mill purposes as the other.

Mr. ADOLPH SUCK. Yes.

Mr. LOUIS SIMPSON. In reference to the floor some questions I have been asked about. Thirty years ago in England, I knew of a weaving shop that was built with a concrete floor and they had trouble for the first twelve months with the dust arising from the floor. In those days, of course, the handling of concrete was not known as it is now.

Mr. ADOLPH SUCK. Yes.

Mr. LOUIS SIMPSON. But they cured the trouble by painting the surface of the floor with spent oil and that did away with all the trouble of the dust. But I have thought that it would be a wise thing that all floors upon which there was much traffic should be covered with a hard wood floor, because in my experiments I have found that when you have the concrete floors and you have a good deal of traffic from trucks and that kind of

Digitized by Google

heavy traffic, there is a great liability of raising dust. It is impossible to get men who are competent enough to put down these top coverings of the cement properly and if they are not looked after, then you have trouble; whereas, if you have a hard wood floor in the alleyways over the concrete, you do away with that trouble and there is some prejudice with the work, people who think that a concrete floor a great deal harder to work on than a wooden floor, although I do not think myself that it is any harder than a hard wood floor.

Mr. JUSTIN WARE. Mr. President, in regard to the question of the fastening down of the machinery, as it is well known, the severest test is in the weave room. There is more vibration in the looms than anywhere else. I will state that I have seen a weave room with a concrete floor and the looms were fastened down to Southern pine plugs that were embedded in the cement and fastened by ordinary coach screws right into these plugs and the looms stand perfectly firm without any vibration whatever. I made some inquiry regarding it, as to how it lasted and they said they had never had a loom work loose, running at high speed also. Regarding the dust on the concrete floor, they laid the dust by passing over the floor a skimming of linseed oil at regular intervals so that it formed a kind of a skin or a glazing over the cement which was glossy and was very apparent if you looked at it and it was very successful and was so pronounced. I would say that wherever trucks were moved they had a board covering over this concrete to allow the passage of trucks so as not to endanger the concrete; but as far as fastening the looms down, it was a great success.

Mr. LOUIS SIMPSON. There is one other little question I would like to ask. What special arrangement do yon have for the finishing of the walls and ceilings? There is a little difficulty which I have experienced; when you take off your false work you are liable, if your men have not been very careful, to find the surface rather pock-marked and it is nice to have it

Digitized by Google

smooth enough to take the whitewash well. Have you something to suggest to prevent that?

Mr. ADOLPH SUCK. None, sir; except care in putting it up and the man who makes it watches the cement. I can show a building which was built by the contractor who has built a building in Boston and also that in New Bedford, C. E. SMITH, the large general mill contractor. He has a surface and that I must say is far ahead of anything made by the so-called experts in reinforced mill construction and it is simply taken care of by having his forms planed and by oiling the sides when they pour in concrete and when they first pour the concrete in the bottom they lay a rich layer of cement, so that when they are dropping the stone, which is the heaviest part of the ingredients, it does not fall away from the other part and leave these pockets. We lay a rich layer in the bottom of the beam, about six inches, and then lay the stone into that and that fills up the gap.

Mr. LOUIS SIMPSON. Did he use the lumber for the false work tongued and grooved?

Mr. ADOLPH SUCK. Yes, tongued and grooved.

Mr. ROBERT MCARTHUR. I would like to ask, Mr. SUCK, if they do weaving in this mill in New Bedford that you speak of.

Mr. ADOLPH SUCK. No, it is used for a paper mill.

Mr. ROBERT MCARTHUR. Would you recommend building say a two-story weave shed with reinforced concrete?

Mr. ADOLPH SUCK. Yes, sir, as with a mill of concrete you can put weaving shed in the second story.

Mr. ROBERT MCARTHUR. I realize very easily that on the first floor you might have a good solid foundation without much vibration, but there was the question in my mind as to whether it would answer for the second and third floors.

Digitized by Google

Mr. ADOLPH SUCK. You would have the same; you would have just as much rigidity in the top floor as you would have in the first floor. As proof of my statement there appeared in the last number of the Engineering News the description of a building at Tunis, Africa, which canted over twenty degrees. If that had been a brick building or any other constructed building it would have gone to pieces. The building settled on one side and the constructors had such confidence in the building that they unloaded the building, which was filled with grain, and transmitted the load on to the opposite side and dug away the foundation and the earth on that side and camped the building right back to its original position, so that the building today stands 15 to 18 feet below the original level. Now you might laugh at that statement, but if you get that Engineering News you will see a photograph of that building in that condition.

Mr. JOHN H. ESTES. I would like to ask if any of those concrete buildings went through the San Francisco earthquake.

Mr. ADOLPH SUCK. Were there any?

Mr. JOHN H. ESTES. Yes.

Mr. ADOLPH SUCK. The majority of the buildings that went through the earthquake, that stood, were reinforced concrete buildings; but there has been a great prejudice against concrete construction and there have been a great many failures, but those failures have only been due to carelessness. You know with a concrete building you can mix concrete and you cannot tell what you are going to get until you get your forms down; then you do not know until you get it loaded, because you cannot see what is inside when it is once covered up.

Mr. JOHN H. ESTES. Are not those steel rods that you put into that concrete weakened by corrosion after a while?

Mr. ADOLPH SUCK. No.

Digitized by Google

Mr. LOUIS SIMPSON. They never corrode.

Mr. JOHN H. ESTES. What never corrode?

Mr. ADOLPH SUCK. It has been found that they do not corrode. They have even dug up ruins in Rome and found some of the iron works embedded in the concrete which they call stone now, which we cannot tell just what the mixture was. At this time you cannot tell what they used, but we find now in the ruins in Rome iron mixed right in with the structures and showing no effect of corrosion whatever.

Mr. LEWISON. Mr. President, I would like to add my testimony to that. In France it has been proven that you can put rusty iron into concrete and that the acid in the concrete will destroy that rust and after a number of years you can break the iron away from that concrete and find the iron quite bright, so that instead of there being danger of the iron corroding, the iron in the reinforced concrete is preserved forever.

Mr. C. J. H. WOODBURY. Mr. President, in regard to the effect of concrete or mortar upon the iron by way of its preservation, I would say that when the Boston Theatre was built about the year 1854, the proscenium arch was built up with wire lath or wire netting which was imported from France. A few years ago, in the course of some alterations, that was opened up and those small iron wires were found to be all right and in good condition.

Mr. LOUIS SIMPSON. Hear, hear!

Mr. C. J. H. WOODBURY. There is, however, one matter in connection with the iron work of buildings which is entirely independent of the cement, and that is the question of electrolysis. The return current from the street railway systems carries on a chemical action whenever there is a change in conductors and the copper roofs of the fireproof buildings in New

Digitized by Google

York City, connected with the earth by the waste pipes and ducts, are receiving that corroding effect from the electricity passing from the earth, and what was considered to be the most permanent form of roofing material, namely, copper, is corroding very badly wherever it meets the solder joints, if the situation of the building is such that it is in the path of one of those return earth currents. And you gentlemen will find it worth while to have some good electrical engineer make electrical measurements to find out whether any of those return currents are passing through parts of your water pipes for fire purposes, any underground construction or boilers, boiler connections or tanks in connection with bleaching or dyeing plant. Insulating joints can be put in, the matter can be corrected, before the corrosion becomes serious.

Mr. LOUIS SIMPSON. But, Mr. Secretary, there would be no corrosion except in the presence of oxygen, and these currents cannot effect the iron that was fully imbedded in the concrete, could they?

Mr. C. J. H. WOODBURY. Yes, the oxygen could be furnished with any moisture which might be present, the oxygen being formed by the dissociation of that water into its oxygen and hydrogen at the juncture of two metals of different electrical equivalencies; that is, any soldered joint or wrought iron and cast iron.

Mr. LOUIS SIMPSON. Yes, but in the case of reinforced concrete neither of those conditions exist.

Mr. C. J. H. WOODBURY. Where one piece of metal approaches another I think there is generally enough of a difference of condition in the juncture to possibly make a flow of electricity from one to the other if there is any possibility of any moisture being present.

Mr. ALBERT FARWELL BEMIS. Mr. President, I would like

Digitized by Google

to ask if Mr. SUCK knows of a modern reinforced concrete structure in San Francisco that did go through the earthquake?

Mr. ADOLPH SUCK. I do not know one that went entirely through it. There were several buildings, I think the St. John building went partly through it, but they had very little to do on the building. There were several reinforced concrete buildings in Baltimore that went through the fire. I do not know just the names of one of them; the walls fell down and the floors remained, so they simply had to build up the outside walls.

Mr. ALBERT FARWELL BEMIS. I believe that in San Francisco there was, practically speaking, not a modern reinforced concrete structure of any consequence previous to the earthquake and the fire. I believe, however, that as far as there were any examples of it in portions of buildings or otherwise, it did stand the earthquake test as well as the fire test. In this particular connection I would like to say, having been in San Francisco within two months, that there are more examples of reinforced concrete construction that one can see going on there, buildings going up, than probably any other spot on earth today and some of them are evidently being properly constructed. There are some of them that look pretty shabby and it seems to me that there is danger that a little later on this type of construction will get a black eye, if you will pardon the slang, from some of these very inferior buildings collapsing. When they are once built everything is covered up and nobody knows what is inside. There are two or three or a number there which are pretty flimsy affairs, although there are also buildings going up there which I should judge were good for all time.

Mr. LOUIS SIMPSON. Mr. SUCK, I would like to ask you another question. Isn't it a fact that the sand used at San Francisco is of very poor quality?

Mr. ADOLPH SUCK. I am sure I cannot answer that question because I do not know what the sand is there.

Digitized by Google

Mr. LOUIS SIMPSON. I have been informed so, that the sand that was used there to make their reinforced concrete buildings is of very inferior quality — that it is seashore sand — very fine and not at all the best to give a first rate job. Therefore it could be understood that a building made under those conditions and slighted by a contractor would be very liable to come to grief.

Mr. ADOLPH SUCK. The majority of the buildings, I wish to say, that have failed have been wholly due to the slackness of the contractor in slighting his work. A few years ago there was no such occupation as that of architect, but a man who wanted a house would go to a builder and say, "Build me a house." Then came the architects. Then what we called the millwright came on, and now we have the mill engineer. Now the contractors are taking it up and furnishing their own plans and building their own buildings. I meet people who say, "Well, I can go to this builder and he will make my plans for me and do everything, and I can save my money to put in the plant." I say, "All right, go ahead. If you were going to spend ten thousand dollars on a house you would not go to a carpenter and say, 'Build me a house;' you would want to know first what you were going to get." The same applies to this. It is of the utmost importance to employ for such work engineers who are familiar with this form of construction, who have their business reputation at stake, and who will hold the contractors to their contract, and see that they carry out the plans and specifications in details. A great deal depends upon the placing of the iron reinforcements, the mixing of the cement, and the taking down of the forms in a building of this kind.

The PRESIDENT. Unless there are any other important questions we had better proceed to the remaining business, as the time is drawing near when we must be getting ready to go to Lynn.

The Secretary has an announcement.

Digitized by Google

The SECRETARY. The electric cars which will take the party to the River Works of the General Electric Company, will start from in front of the Public Library — not in front of this building, and lunch will be served at the works. Those cars will run on a schedule which requires them to start at half past one. It is hoped by the General Electric Company that all interested will go.

ELECTION OF OFFICERS.

Mr. JUSTIN A. WARE, on behalf of the tellers, made the following report on the election of officers.

The committee on ballots respectfully report ninety-one ballots, all for the officers named on the printed list, as follows:

PRESIDENT.

WILLIAM D. HARTSHORNE, LAWRENCE, MASS.

VICE-PRESIDENTS.

CHARLES T. PLUNKETT, ADAMS, MASS.
GEORGE OTIS DRAPER, HOPEDALE, MASS.

DIRECTORS FOR THREE YEARS.

WILLIAM H. LOFTUS, NEWARK, N. J.
JOHN W. KNOWLES, NEW BEDFORD, MASS.
HENRY F. MANSFIELD, UTICA, N. Y.

DIRECTOR FOR TWO YEARS.

EDWIN FARNHAM GREENE, BOSTON, MASS.

DIRECTOR FOR ONE YEAR.

FREDERICK A. FLATHER, LOWELL, MASS.

Respectfully submitted,

JUSTIN A. WARE,
JOSEPH MERCER.

Digitized by Google

The PRESIDENT. I have pleasure in declaring these officers unanimously elected, and ask Mr. SIMPSON if he will kindly escort the new president, Mr. HARTSHORNE, to the platform.

[The president-elect was then escorted to the platform by Mr. LOUIS SIMPSON, and greeted by the hearty applause of the members.]

President MACCOLL. Allow me, sir, to congratulate you upon the honorable office to which you have been elected. I have been associated with you for several years on the Board of Government, and I am sure that the affairs of the association in your hands will be progressively and conservatively managed, and that we shall see great development of the association under your care; and I can assure you, sir, that I shall be ready at all times to render you the very best assistance that I can whenever called upon. [Applause.] The meeting is now in your hands.

[The president-elect assumed the chair.]

President HARTSHORNE. I thank you Mr. MACCOLL. I also beg to thank the membership for this kind expression of their confidence. Some two years ago, when my friend Mr. MACCOLL undertook the duties of this office, I think perhaps on this platform, he made a statement that he hoped he was not going to be one of the square men who was trying to fill a round hole. I am sure you will agree with me, not only that he has been the "square man," but also that he has filled the chair which he has occupied most fully and squarely. I am reminded also that our present president of the United States, when he undertook the duties of the lamented MCKINLEY, promised himself and the world that he would try to carry out the policies which had been inaugurated before him. I do not claim to have either the ability or the capacity of a Roosevelt, but so far as it lies in me, with the aid of our indefatigable secretary and able Board of Government, I sincerely hope to be able to give you at least a "square deal." I thank you, gentlemen.

Digitized by Google

Mr. Secretary, is there any further business?

The SECRETARY. I know of no further business, Mr. PRESIDENT.

The PRESIDENT. I will, therefore, declare this meeting adjourned.

[Adjourned at 12.43 P. M.]

Attest:

C. J. H. WOODBURY,

Secretary.

Digitized by Google

FOURTH SESSION.

THURSDAY, APRIL 25, 1907, at 1.30 P. M.

Thursday afternoon was devoted to an excursion to the River Works of the General Electric Company at Lynn, Mass., in which the members of the Association were the guests of the company.

The party left Boston on a number of special electric cars, and on arrival at the River Works were received by Mr. WALTER FISH, manager, and Professor ELIHU THOMSON, consulting electrician of the company.

The party was divided into small groups, each of which was in the custody of a guide who explained the various objects of interest.

This group of works was established in 1892, and employs about six thousand operatives, while an equal number are at the West Lynn Works, which are devoted to the manufacture of meters, instruments, arc lamps, small motors and supplies, and a third factory in Lynn, to the manufacture of incandescent lamps.

The River Works are devoted to the manufacture of transformers, stationary and railway generators, and also the Curtis turbine.

The first building visited by the party was used for the manufacture of the Curtis steam turbine and its generators, in sizes

Digitized by Google

from 5 K.W. to 1500 K.W. This building is 850 feet in length, and 140 feet in width with a travelling crane on one side and gallery bays on the other.

Opportunities were given to examine turbines in process of manufacture which require many special tools driven individually by electric motors, and also to examine the turbines in operation, as all are tested before shipment.

The next building was devoted to the manufacture of railway and stationary motors. This is over 900 feet long and about 120 feet wide. A great diversity of work is done in this building as there are several hundred different sizes and types of motors made in this building weekly.

One shop is used for cutting gears and pinions for motor equipment; another for automatic winding, and another is devoted to the manufacture of transformers for lighting and power purposes.

The last building to be visited was one recently completed and not fully equipped, but will be used for the manufacture of smaller power motors. This building is 512 feet long by 82 feet wide, and is of modern concrete construction. In the upper story of this building the party examined with great interest a jacquard silk loom, worsted loom, and spinning frame, driven by individual motors. This method of driving was so steady that these machines were on skids and not attached to the floor in any manner.

After lunch was served, the secretary stated that preliminary to offering a vote of thanks he had been requested by Manager FISH to state that his only regrets in connection with this visit was the limitation of time, which prevented the careful and full examination of the great plant which they would desire to offer, but he desired to extend an invitation to any members of The National Association of Cotton Mauufacturers who were interested in electric lighting or the transmission of power to call at the Works, where every facility would be given to present to them facts bearing upon the object of their inquiry, and in order that arrangements could be made for a special escort it was

Digitized by Google

especially desired that such persons should write to the General Electric Company at West Lynn, Mass., a few days in advance of their proposed visit.

President HARTSHORNE initiated his active duties by putting the vote of thanks, which was unanimously passed. The party was then photographed,* and rejoining the special cars, returned to Boston late in the afternoon.

* Persons desiring copies of this group, four by ten inches, suitably mounted on a card, can obtain them upon application to Mr. MAGNUS W. ALEXANDER, care of The General Electric Company, West Lynn, Mass.

Digitized by Google

INDEX.

A

Abatement of Taxes 189
Abercrombie, James H., Elected Active Member, April 25, 1907 310
Accounts for Cotton Mills . . . 169
Active Members 18
Advertisements, Income from . 117
Allen, G. Bion, Elected Active Member, April 25, 1907 . . . 311
Almirall, J. A., Resolution of Thanks to 336
Alphabetical List of Members . 17
Amendment to Constitution and By-Laws 11
American Cotton Manufacturers Association, Telegram from . 309
American Cotton Textiles in the Far East, John Foord . . . 233
American Increase in Spindles . 134
American Telephone and Telegraph Company, Resolution of Thanks to 336
Annual Banquet, April 25, 1907, 288
Appraisal of Machinery, Schedule of 193
Appraisal for Taxation, Henry K. Rowell 175
Appraisers, United States Custom 217
Associate Members 41
Association Medal, Committee on 104
Association Medal Committee, Report of 120
Association Medal, Number 6, Awarded to Charles B. Burleigh 120
Atlantic Cable, Laying of . . . 155
Attendance at Second Annual Banquet, April 25, 1907 . . 272
Attendance at 82d Meeting . . 83
Auditor's Report, 82d Meeting, C. E. Roberts 116
Aumann, Louis A., Elected Active Member, April 25, 1907 311
Ayer, George A., Member Committee on Association Medal 104
Ayer, George A., Member Committee on Resolutions . . . 133
Ayer, Nathaniel F., Member Meeting Committee at 82d Meeting 96

B

Bagwell, Wiley Nesbit, Recipient of Student's Medal, 82d Meeting 105
Baled Cotton, Tests of Moisture in 268
Banquet, Second Annual . . . 271
Bemis, Albert Farwell, Concrete Construction, San Francisco Earthquake 393

Digitized by Google

Bemis, Albert Farwell, Member Dinner Committee at 82d Meeting 95
Billings, R. Bloss, Elected Active Member, April 25, 1907 . . . 311
Bills of Lading, Resolution of Thanks on 335
Bishop, Louis W., Elected Active Member, April 25, 1907, 311
Blunt, Harry H., Elected Active Member, April 25, 1907 . . . 311
Board of Government 11
Bolon, J., C., Elected Active Member, April 25, 1907 . . . 311
Booth, George H., Elected Active Member, April 25, 1907 311
Booth, Joseph W., Elected Active Member, April 25, 1907, 311
Borden, Charles N., Elected Active Member, April 25, 1907, 311
Boston, Mayor of, Hon. John F. Fitzgerald 127
Boston Museum of Fine Arts, Resolution of Thanks to . . . 336
Bremen Cotton Exchange . . . 140
British Cotton Growing Association 138
Bromley, Edward, Elected Active Member, April 25, 1907, 311
Brooks, Christopher P. Member Committee on Moisture in Baled Cotton 262
Bryant, C. B., Telegram from . 309
Bullard, W. Irving, Elected Associate Member, April 25, 1907 316
Burdett, Everett W., Corporations and the Public Welfare . 149
Burdett, Everett W., Resolution Thanks to 336
Burgess, Robert, Member Committee on Nominations, 82d Meeting 103
Burleigh, Charles B., Acknowledgment of Association Medal 121
Burleigh, Charles B., Sixth Associasociation Medal 120
Butler, Paul, Elected Active Member, April 25, 1907 . . . 311
By-Laws 7

C

Call to Eighty-Second Meeting 94
Capitalization of Savings . . . 187
Carhartt, Hamilton, Elected Active Member, April 25, 1907, 311
Carrick, Allison D., Elected Active Member, April 25, 1907, 311
Chafee, John W., Memorial Sketch of 77
Change of Name 6
Charities by Affluent People . . 153
Charter 5
Chase, Harvey Stuart, Cost of Maintenance and Depreciation in Cotton Mills 169
Chase, Harvey Stuart, Resolution of Thanks to 336
Child Labor 143
Chinese Cotton Trade 235
Clark, Alfred L., Elected Active Member, April 25, 1907 . . . 312
College Property, Resolution, Organized Taxation of . . . 334
Colleges, Education of, Henry Smith Pritchett 123
Comber, Whitin High Speed, Elwin H. Rooney 339
Committee on Moisture in Baled Cotton 262
Conference of Cotton Growers and Manufacturers 110
Constitution and By-Laws . . . 7
Cook, G. Arthur, Elected Active Member, April 25, 1907 . . 312
Corporations and the Public Welfare, Everett W. Burdett 149

Digitized by Google

Cost of Maintenance and Depreciation in Cotton Mills, Harry Stuart Chase 169
Cotton, Baled, Report of Committee on Moisture in 262
Cotton Commission, Lancashire 110
Cotton Crop 1906 200
Cotton Exchanges in New England 140
Cotton Goods, Tariff on, Edwin A. Hartshorn 216
Cotton Growers and Manufacturers, Conference of 110
Cotton, Sea Island, George A. Gordon 242
Cotton Storehouses, W. C. Moore 231
Cotton, Transit of 136
Covel, Alphonse S., Memorial Sketch of 78
Cox, Thomas G., Member Committee on Resolutions . . . 133
Crankshaw, Amos, Elected Active Member, April 25, 1907 312
Crompton, George, Elected Active Member, April 25, 1907, 312
Crops and Prices of Sea Island Cotton 260
Crosby, William W., On Industrial Education 196
Crossland, John A., Elected Active Member, April 25, 1907, 312
Crowther, John, Elected Active Member, April 25, 1907 . . 312

D

Danker, Daniel J., Member Committee on Meeting 82d Meeting 96
Demurrage 136
DeWolfe, John O., Member Committee on Meeting at 82d Meeting 96
Dinner Committee, 82d Meeting 96
Dinner of 82d Meeting, Notice of 99
Dinner, Second Annual, April 25, 1907 271
Draper, George Otis, Chairman Meeting Committee at 82d Meeting 96
Draper, George Otis, Elected Vice President 395
Dunn, George W., Elected Active Member, April 25, 1907. 312

E

Eames, Charles H., Elected Active Member, April 25, 1907, 312
Earnings of the Association, 82d Meeting 116
Eccles, John, Member Committee on Nominations 82d Meeting 103
Education of Colleges, Henry Smith Pritchett 123
England, Increase of Spindles in 134
English Commission on Cotton 138
Estes, John H., Concrete Building 390
Etamines, Duty on 221
Exports of Cotton Goods to China 235

F

Fairbanks, William Kendall, Elected Active Member, April 25, 1907 312
Farmer's Educational Union . . 137
Financial Table of Association . 119
Firth Scholarship 107
Fish, Charles H., Member Dinner Committee at 82d Meeting 95
Fish, Walter, Manager General Electric Works 398
Fitzgerald, Hon. John F., Resolution of Thanks to 336

Digitized by Google

Fitzgerald, Hon. John F., Welcome to the City of Boston . 127
Fixed Charges on Property . . 186
Flat Roller Gin 252
Flather, Frederick A., Elected Director for one year 395
Foord, John, American Textiles in the Far East 235
Foord, John, Resolution of Thanks to 336
Foreign Mill Employees . . . 142
Former Officers 12
Foss, Eugene N., Elected Active Member April 25, 1907 . . . 312
France, Edward W., Textile School a Necessity to the Future of the Industry . . . 319
Freeman, Allen A., Elected Active Member April 25, 1907 312
Funds of the Association . . . 115

G

Gaunt, Alfred C., Elected Active Member April 25, 1907 . . . 312
General Electric Company, Resolution of Thanks to 337
General Electric Works, Excursion to 398
Geographical Distribution of Membership 75
Geographical List of Members . 50
Gerow, S. P., Elected Active Member April 25, 1907 . . . 312
Ginning of Sea-Island Cotton . 252
Goff, Albert H., Elected Active Member April 25, 1907 . . . 312
Gordon, George A., Resolution of Thanks to 336
Gordon, George A., Sea Island Cotton 242
Greene, Edwin Farnham, Elected Director for two years . . . 395
Greene, Edwin Farnham, Member Committee on Meeting . 96
Guerin, Edmond H., Elected Associate Member April 25, 1907 316
Guests at 82d Meeting 90

H

Hamblin, George B., Elected Associate Member April 25, 1907 316
Hartshorn, Edwin, Resolution of Thanks to 336
Harrington, J. Potter, Elected Active Member April 25, 1907, 312
Hartshorne, William D., Address on Taking Office as President, 396
Hartshorne, William D., Chairman of Committee on Moisture in Baled Cotton 262
Hartshorne, William D., Elected President 395
Hayward, Harry T., Elected Active Member April 25, 1907, 313
Hazard, Jeffrey, Elected Associate Member April 25, 1907, 316
Heminway, Charles M., Elected Associate Member April 25, 1907 316
Hobbs, Franklin W., Chairman Committee on Resolutions . 133
Holmes, Judge Oliver W., On Future Contracts 212
Honorary Members 17
Hosmer, Amos G., Elected Active Member April 25, 1907 313
Howard, Elisha H., Elected Active Member April 25, 1907 313
Howland, Walter J., Elected Active Member April 25, 1907 313
Hubbard, Samuel T., New York Cotton Exchange and its Contract for Delivery of Cotton . 199
Hume, W. S., Elected Active Member April 25, 1907 . . . 313

Digitized by Google

I

Industrial Education, William W. Crosby 196
Insurance of Accidents to Workmen 146
International Conference of Cotton Growers and Manufacturers 137
International Conference of Cotton Growers and Manufacturers, Itinerary of 337
International Cotton Congress, Notice of 97
Interstate Commerce Commission 158
Interstate Commerce Commission, Resolution on 334

J

Jenckes, Frederick L., Elected Active Member April 25, 1907, 313

K

Kerr, James B., Elected Active Member April 25, 1907 . . . 313
Kinsman, Nathaniel, Elected Associate Member April 25, 1907 316
Knowles, John K., Elected Director for Three Years . . 395

L

Labor Legislation 145
Labor at the South Insufficient . 142
Lancashire Cotton Commission, 110
Langlands, Daniel G., Elected Associate Member April 25, 1907 316
Lapham, Leonard C., Elected Active Member April 25, 1907, 313
Law of Taxation, Henry K. Rowell 176
Lawrence, George P., Address at Second Annual Banquet . 282
Lawrence, Hon. George P., Resolution of Thanks to . . 336
Laycock, Berry, Elected Active Member April 25, 1907 . . . 313
Lehan, William A., Elected Active Member April 25, 1907 313
Life Members 17
Life Membership 11
Life Membership 107
Loftus, William H., Elected Director for Three Years . . 395
Lovering, William C., Address at Second Annual Banquet . 298
Lowe, Arthur H., Member Committee on Resolutions . . . 133
Lowe, Russell B., Elected Active Member April 25, 1907 . . . 313
Lyall, William L., Member Committee on Nominations, 82d Meeting 103

M

Macara, C. W., Elected Active Member April 25, 1907 . . . 313
MacColl, James R., Address of Retirement as President . . 396
MacColl James R., Address at Second Annual Banquet, April 25, 1907 272
MacColl, James R., President's Address at 82d Meeting . . 134
Machinery, Applications of . . 183
Machinery, Proposed System for Cleaning, Robert Schaellibaum 354
Machinery, Valuation of . . . 183
Main, Charles T., Member Committee on Association Medal . 105
Maintenance and Depreciation in Cotton Mills, Cost of, Harvey Stuart Chase 169

Digitized by Google

Mansfield, Henry F., Elected Director for Three Years . . 395
Manufacturers Bureau of Exhibit of Yarn 96
Marble, Augustus B., Elected Associate Member April 25, 1907 316
Martin, Edward L., Elected Associate Member April 25, 1907 317
Massachusetts Institute of Technology, Resolution of Thanks to 336
McLaughlin, John E., Elected Active Member April 25, 1907 313
Meader, Charles E., Elected Active Member April 25, 1907 313
Meeting Committee at 82d Meeting 96
Meeting, 82d, Attendance at . 83
Members Present at 82d Meeting 83
Membership at 82d Meeting . . 107
Membership, Total 49
Memorial Sketches 77
Merriam, Charles E., Elected Active Member April 25, 1907 314
Metcalf, Walter C., Elected Active Member April 25, 1907 314
Methods of Cotton Shipment . 335
Milliken, Albert D., Elected Active Member April 25, 1907 314
Mitchell, William A., Elected Active Member April 25, 1907 314
Moisture in Baled Cotton, Report of Committee on 262
Moisture in Baled Cotton, Tests of 268
Molleton of Weaving Felt . . . 220
Moore, W. C., On Southern Cotton Storehouses 231
Morison, George B., Member Dinner Committee at 82d Meeting 96
Murray, James P., Elected Active Member April 25, 1907 314
Murphy, W. C., Elected Associate Member April 25, 1907 . 317
Museum of Fine Arts, Boston, Invitation to 102
Museum of Fine Arts, Resolution of Thanks to 336

N

Name, Change of 6
National Society for the Promotion of Industrial Education . 196
Necrology at 2d Meeting . . . 107
New England Telephone and Telegraph Company, Resolution of Thanks to 336
New York Cotton Exchange and Its Contract for Delivery of Cotton, Samuel T. Hubbard . 199
Nicholson, Theodore O., Elected Active Member, April 25, 1907 314
Nominating Committee, Report of 348
Nominations, Committee on, 82d meeting 103

O

Officers 12
Officers from the Origin of the Association 13
Olney, Louis Atwell, Member Committee on Moisture in Baled Cotton 262
Oriental Goods, Samples of . . 110
Oriental Trade for Textiles, John Foord 235

P

Packing of Sea Island Cotton . . 254
Paine, Sidney B., Member Com- on Association Medal . . . 104
Paine, Sidney B., Member Committee on Resolutions 133

Digitized by Google

Parker, Walter E., Member Committee on Nominations at 82d Meeting 103
Periodicals at Headquarters . . 112
Perkins, John, Elected Associate Member, April 25, 1907 . . 317
Perkins, Thomas, Jr., Elected Active Member, April 25, 1907 314
Perry, Charles M., Elected Active Member, April 25, 1907 314
Pihl, Victor E. Elected Active Member, April 25, 1907 . . . 314
Plunkett, Charles T., Chairman Committee on Association Medal 104
Plunkett, Charles T., Elected Vice-President 395
President's Address, 82d Meeting James R. MacColl 134
Pritchett, Henry Smith, Welcome to the Institute 122
Programe of 82d Meeting . . . 98
Proposed System for Cleaning Machinery, Robert Schaellibaum 354
Protests of Importers 146
Public Ownership 163
Public Utility Corporations . . 157

Q

Quasi-Public Corporations, Regulation of 159
Quinn, Michael W., Memorial Sketch of 79

R

Railroads, Early 154
Reany, J. H., Elected Active Member, April 25, 1907 . . . 314
Regulation of Railroads 166
Rennie, William H , Memorial Sketch of 80
Report of Committee on Moisture in Baled Cotton 262
Resolution on Organized Taxation of Property 334
Resolutions, Committee on . . 133
Resolutions of Thanks 336
Reynolds, Hiram L., Elected Active Member, April 25, 1907, 314
Riley, Richard G., Elected Active Member, April 25, 1907, 314
Roberts, C. E., Report of Auditor, 82d Meeting 116
Robbins, Charles, Elected Associate Member, April 25, 1907, 317
Roofs, Effected by Electrolosis, C. J. H. Woodbury . . . 392
Rooney, Elwin H., Whitin High Speed Comber 339
Rowell, Henry K., Resolution of Thanks to 336
Rowell, Henry K., Taxation and Valuation 175

S

Sanborn, W. K., Elected Active Member, April 25, 1907 . . 314
Schaellibaum, Proposed System for Cleaning Machinery . . . 354
Schedule of Machinery to be Valued 193
Schofield, Robert, Elected Active Member, April 25, 1907 . . 314
Schuster, Winfield S., Elected Active Member, April 25, 1907 315
Sea Island Cotton, Crops and Prices 260
Sea Island Cotton, George A. Gordon 242
Sea Island Cotton, History of . 244
Sea Island Cotton, Varieties of . 248
Secretary's Report at 82d Meeting, C. J. H. Woodbury . . 104
Shepardson, Edwin G., Elected Active Member, April 25, 1907, 315
Silk Imitation, Duty on 227

Digitized by Google

Simpson, Louis, Concrete Construction at San Francisco Earthquake 394
Simpson, Louis, On Concrete Construction 385
Smith, H. Cowles, Elected Associate Member, April 25, 1907, 317
Smith, Robert A., Elected Active Member, April, 25 1907 . . . 315
Southern Cotton Association . . 137
Speculation in Cotton 212
Spindles. Increase of in England, 134
States, Members by 50
Stevens, Dexter, Elected Active Member, April 25, 1907 . . . 315
Stevens, John A., Elected Active Member, April 25, 1907 . . 315
Stevenson, William M., Elected Active Member, April 25, 1907 315
Stone, Henry W., Elected Active Member, April 25, 1907 . . . 315
Stone, Thomas, Elected Active Member, April 25, 1907 . . . 315
Street Cars, Origin of 155
Strongman, John B., Elected Active Member, April 25, 1907, 315
Student's Medal 105
Student's Medal, Methods of Awarding 105
Suck, Adolph, Elected Associate Member, April 25, 1907 . . . 317
Suck, Adolph, Resolution of Thanks to 336

T

Table of Membership of Association 108
Talcott, Louis Hart, Recipient of Student's Medal, 82d Meeting 105
Tariff on Cotton Goods, Edwin A. Hartshorn 216
Tattersall, John Lincoln, Elected Active Member, April 25, 1907, 315
Tattersall, John Lincoln, Address at Second Annual Banquet, April 25, 1907 309
Tattersall, John Lincoln, Resolution of Thanks to 336
Taxation of College Property, Resolution on 334
Technical Training, Henry Smith Pritchett 124
Telegraph Line, Establishment of 155
Textile Instruction, Edward W. France 319
Textile School a Necessity to the Future of the Industry, Edward W. France 319
Textiles in the Far East, John Foord 235
Thayer, Gay D., Elected Associate Member, April 25, 1907, 317
Thomson, Prof. Elihu, Resolution of Thanks to 336
Thomson, Prof. Elihu, Address at Second Annual Banquet, April 25, 1907 288
Thomson, Prof. Elihu, Electrician, General Electric Works, 398
Thomson, James, Elected Active Member, April 25, 1907 . . . 315
Tillinghast, Henry A., Memorial Sketch of 80
Total Membership 49
Transactions of Technical Societies 112
Treasurer's Report, 82d Meeting C. J. H. Woodbury 114

U

Utter, George H., Address at Second Annual Banquet . . 275
Utter, Hon. George H., Resolution of Thanks to 336

Digitized by Google

V

Valuation and Taxation, Henry K. Rowell 175
Vibration of Mills, Justin A. Ware 388

W

Wages, Increase of 149
Wakeman, Hon. Wilbur F., Address at Second Annual Banquet, April 25, 1907 . . . 300
Wakeman, Wilbur F. Resolution of Thanks to 336
Walmsley, Herbert E., Chairman, Committee on Nominations, 82d Meeting 103
Ware, Justin A., On Vibration of Mills 388
Water in Corporation Stock . . 162
Watts, Ridley, Elected Active Member, April 25, 1907 . . . 315
Welcome to the City of Boston, Hon. John F. Fitzgerald . . 127
Welcome to the Institute of Technology, Henry Smith Pritchett, 122
Whitin High Speed Comber, Elwin H. Rooney 339
Whitman, Harold C., Elected Active Member, April 25, 1907, 315
Williams, Franklin D., Chairman of Dinner Committee, 82d Meeting 95
Williamson, Thomas William, Recipient Student's Medal, 82d Meeting 105
Wilmarth, Merton J., Elected Active Member, April 25, 1907, 315
Wilson, George A., Elected Active Member, April 25, 1907 316
Wilson, Newton, Elected Active Member, April 25, 1907 . . . 316
Wilson, R. L., Elected Active Member, April 25, 1907 . . . 316
Winn, Thomas, Elected Associate Member, April 25, 1907, 317
Wire Laths Introduced into Boston Theatre 391
Wire Laths, Permanence of, C. J. H. Woodbury 391
Wireless Telegraphy 295
Wood, Herbert Charles, Recipient Student's Medal, 82d Meeting 105
Woodbury, C. J. H., Electrolosis in Buildings 392
Woodbury, C. J. H., Permanence of Wire Laths 391
Woodbury, C. J. H., Preservation of Iron by Plaster . . . 391
Woodbury, C. J. H., Secretary's Report 82d Meeting 104
Woodbury, C. J. H., Treasurer's Report at 82d Meeting . . . 114
Workmen's Compensation Act . 145

Z

Zellers, George E., Elected Acitve Member, April 25, 1907, 316

Digitized by Google

Digitized by Google

Digitized by Google

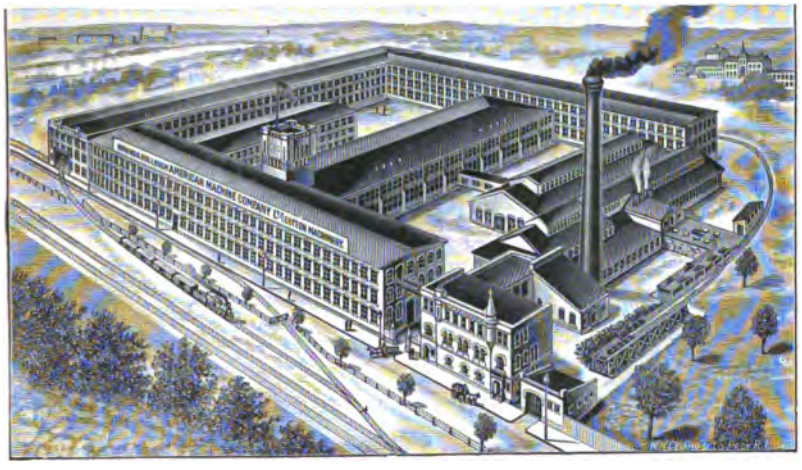
Digitized by Google

HOWARD & BULLOUGH,
AMERICAN MACHINE COMPANY, LTD.
PAWTUCKET, R. I.

C. E. RILEY, Treas.
65 Franklin Street,
Boston, Mass.

Southern Offices:
814-815 Empire Bldg.,
Atlanta, Ga.

COTTON MACHINERY



Hopper Bale Openers
Feeders
Self Feeding Openers
Breaker, Intermediate and
Finisher Lappers.
Revolving Flat Cards
Drawing Frames
Slubbing, Intermediate and
Roving Frames.

Improved New Pattern Spinning Frames
Twisters for Wet or Dry Work
Cone Winders.

Warpers and
Slashers.

Send for Descriptive
Circulars with lists
of users.

WE INVITE YOUR INVESTIGATION AND COMPARISON.

Digitized by Google

C. E. RILEY COMPANY

65 Franklin Street, Boston, Mass.

Builders and Importers of

Cotton

Woolen

Worsted

Machinery

Egyptian Cotton

PEEL & CO., Alexandria

COTTON GOODS
AND
COTTON YARNS

Digitized by Google

Is Your Business Growing?

The question of enlarging manufacturing capacity to meet the demands of increasing business is becoming a pressing one with many manufacturers.

In these circumstances it is of importance that the mills should have been laid out with a view to future expansion, and in no place is this more true than in the power plant.

The matter of providing for future growth in this department has been greatly simplified by the adoption of Rope Drives as a means of conveying power. Our booklet on "Power Transmission" takes up this point and describes the many other advantages of rope transmission.

Do You Use PLYMOUTH Baling Rope?

Plymouth Cordage Company

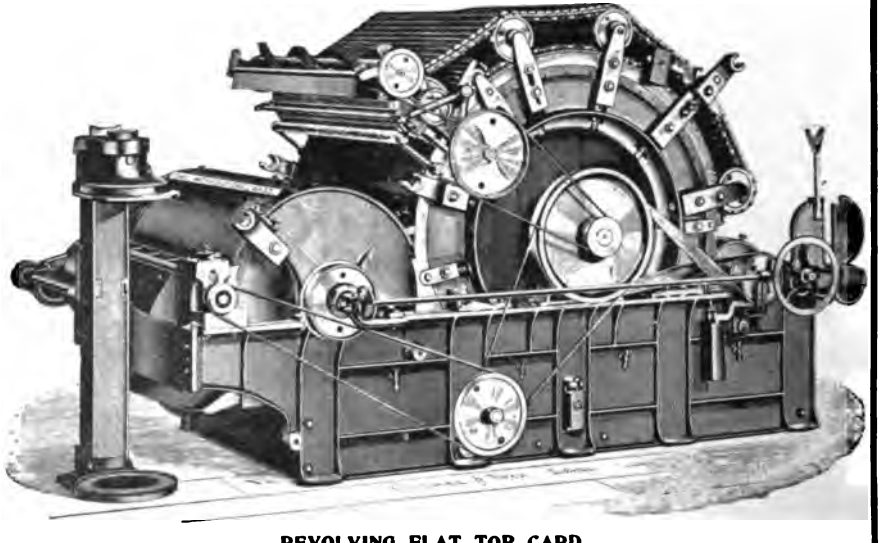
North Plymouth, Mass.

Digitized by Google

LOWELL

Cotton Machinery

of every description, from the Card to the Baling Press



REVOLVING FLAT TOP CARD

COTTON MACHINERY — Cards, Railway Heads, Drawing Frames, Roving Frames, Ring Frames, Spoolers, Warpers, Slashers, Looms, Twisters, Reels, Shearing Machines, Brushing Machines, Folders, Cloth Stamping Machines, Baling Presses, Size Kettles, Etc.

WORSTED MACHINERY — Spinning Frames, Twisters, Dandy Rovers and Reducers, Gill Boxes, Etc.

Lowell Machine Shop

Lowell, Mass.

Digitized by Google

The Dodge Manufacturing Co.

ENGINEERS. FOUNDERS. MACHINISTS.

Mishawaka, Ind.

BRANCHES:

137-139 Purchase Street, BOSTON. 43-45 Dey Street, NEW YORK. 166-174 S. Clinton Street, CHICAGO.
128 W. 3rd Street, CINCINNATI. Prudential Bldg., ATLANTA.

Modern Textile Mill Equipments

Embracing Latest Improved Devices Embodying Highest Efficiency in Power Transmission Engineering.

The "Dodge" American System Rope Transmission.

CAPILLARY SELF-OILING BEARINGS—Oil Economizers.
IRON CENTER WOOD RIM TEXTILE PULLEYS, (Designed for Textile Mill Work)
COUPLINGS,—In Variety.
SAFETY IRON CENTER WOOD RIM FLY WHEELS.
IRON SPLIT AND SOLID PULLEYS, SHAFTING, ETC.

We have a large engineering force and will be pleased to assist you in the determining of your requirements in our line upon receipt of data stating just what you desire to accomplish. **Address Nearest Office.**

Digitized by Google

International Correspondence Schools

TEXTILE DEPARTMENT

Complete Courses of Instruction By Mail in

COTTON MANUFACTURING
WOOLEN MANUFACTURING
TEXTILE DESIGNING

Partial Courses covering Special Branches, such as

Cotton Carding and Spinning
Cotton Warp Preparation and Plain Weaving
Fancy Cotton Weaving
Cotton Designing
Yarn Reeling, Warping and Winding
Woolen Carding and Spinning
Woolen Warp Preparation and Weaving
Worsted Warp Preparation and Weaving
Woolen and Worsted Designing
Theory of Textile Designing and Others

Newly Revised and Up-to-Date Instruction Papers
Practical Instruction, complete even to the most minute detail
Superb Bound Volumes for Reference while studying.

Write for prospectus explaining our system and our 15 different courses of correspondence instruction.

Our Student's Aid Department places (without cost) the mill man in search of trained assistance in communication with capable graduates and students.

The International Library of Technology—Textile Section.

This is the finest reference library on textile subjects extant. It is fully indexed and finely illustrated by our own Illustrating Department and contains about 4000 pages of authoritative information and 2000 drawings and views of modern textile machinery. This work should be accessible to every mill official. Complete in six handsome volumes as follows—

VOLUME 76—Cotton Pickers, Cards, Drawing Rolls, Combers, Fly Frames.
VOLUME 77—Ring Frames, Cotton Mules, Twisters, Spoolers, Warpers, Slashers.
VOLUME 78—Yarns, Cloth Rooms, Mill Engineering, Reeling, Baling, Winding.
VOLUME 79—Wool Scouring, Drying, Burr Picking, Mixing, Carding, Spinning, Warping.
VOLUME 80—Cam, Fancy and Automatic Looms, Dobbies, Box Motions, Leno Attachments, Jacquards.
VOLUME 81—Weave Glossary, Fabric Analysis, Weave Varieties, Color Designs.

Write for further information if desirous of obtaining this valuable Reference Library.

Free scholarships and volumes of the International Library of Technology, not only in textiles but many other subjects, may be obtained by responsible mill officials on conditions that will be gladly communicated on request.

We invite the most rigid investigation and are always pleased to answer inquiries relative to our Courses or our Reference Library.

Address,

C. P. BROOKS, Principal and Manager
International Correspondence Schools
William Street, - New Bedford, Mass.

Digitized by Google

HORIZONTAL or VERTICAL

SIMPLE, COMPOUND or TRIPLE EXPANSION

STEAM ENGINES.

38″ × 78″ × 56″

7,500 Horse-Power Double Horizontal-Vertical Compound Engine,

With 5,000-K. W. Direct Driven Alternating Current Generator.

Speed, 94 Revolutions per minute.

McINTOSH, SEYMOUR & Co., Auburn, N. Y.

Boston Agents:

J. A. GRANT & CO., 1002 Tremont Building.

Digitized by Google

ROWS' PATENT BOILING BATTERY

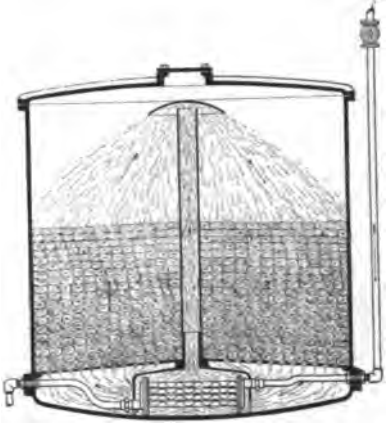
AS APPLIED TO

THE SURFACE HEATING

OF

BLEACHING KIERS AND DYE VATS.

BATTERY.



KIER.

The value of this surface heating as compared with the practice of injecting live steam will be appreciated at once. In case of bleaching kiers we get full and regular circulation through the puffet pipe, avoid the possibility of any dirt or impurities coming from the boilers to discolor fabrics; at the same time we are able to recover the condensation to be re-used as boiler feed.

For further information, apply to the Sole Agents for the United States,

DANKER & MARSTON,

Dye Stuffs and Chemicals,

247 Atlantic Ave., BOSTON, MASS.

82—83

Digitized by Google

DANKER & MARSTON

D & M GUM

For sizing and finishing Cotton, Silk and Wool.

D & M BLEACHING ASSISTANT

For preparing Cotton Stock, Yarn, Knit and Piece Goods for the chlorine.

D & M EGYPTIAN TINT

Producing identical shade of straight Egyptian Cotton; runs absolutely uniform, and is in use by the leading concerns of the country.

D & M SOFTENER

White, strictly uniform and with exceptional softening properties.

D & M BLEACHERS' BLUE

Producing a permanent blue-white tint on Bleached Goods, one not affected by heat, metals, climatic conditions or age.

D & M COLORS

Special products for direct dyeing of Cotton Goods, and the printing of Cotton, Silk and Woolen Fabrics.

D & M FINISHING PRODUCTS

Our specialties for finishing Cotton, Silk, Woolen and Worsted Goods are in use by the leading mills of the United States.

247 Atlantic Avenue

BOSTON

Digitized by Google

American

THE AMERICAN MFG. CO.

MANILA - SISAL - JUTE CORDAGE,

65 WALL ST., NEW YORK.

80 H. P. ANGLE DRIVE, ROPE DRIVE OVER BUILDINGS.

"AMERICAN" TRANSMISSION ROPE

—"The Rope to Remember"—

Can be run in your buildings, over the roofs, and across alleys, as easily as electric wiring; and in place of an expensive dynamo on one end of the transmission, and inefficient motor at the other, you will have nothing more than two rope sheaves.

"THE BLUE BOOK OF ROPE TRANSMISSION"

Sent Free Upon Request.

All about Rope Drives. *Tells How to Splice.*

Rope

Digitized by Google

We illustrate a Spinning Room driven by WESTINGHOUSE Individually Geared Motors.

No line shafting, belts, vibration, oil or dirt.——Instead—light, steady speed, positive power and cleanliness.

RESULTS

Increased Production AND Improved Quality.

The same results are obtained when looms and other machines are individually motor-driven.

Send for Publication "Electric Drive in Textile Mills."

Westinghouse Electric & Mfg. Co.

Address nearest district office for information.

Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Dallas, Denver, Detroit, Los Angeles, Minneapolis, New York, New Orleans, Philadelphia, Pittsburg, St. Louis, Salt Lake City, San Francisco, Seattle, Syracuse,

Mexico: G. & O. Braniff & Co., City of Mexico.
Canada: Canadian Westinghouse Co., Ltd., Hamilton, Ont.

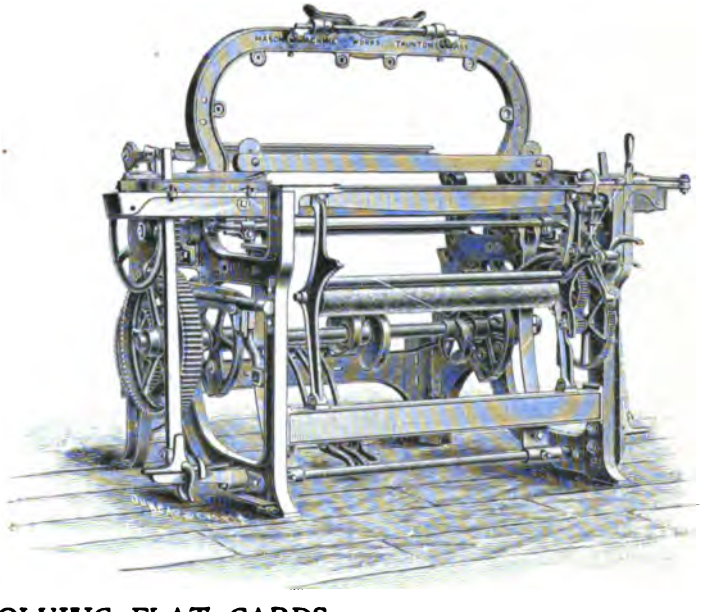
Digitized by Google

MASON MACHINE WORKS,

TAUNTON, MASS.

—— BUILDERS OF ——

COTTON MILL MACHINERY.



REVOLVING FLAT CARDS,
COMBING MACHINERY,
DRAWING FRAMES,
SPINNING FRAMES,
MULES AND LOOMS.

Southern Office Address:

MASON MACHINE WORKS,
CHARLOTTE, N. C.

82—83 T. F.

Digitized by Google

HARDING WHITMAN & CO.

Dry Goods Commission

....*Merchants*....

BOSTON, NEW YORK, PHILADELPHIA,

CHICAGO, BALTIMORE, ST. LOUIS.

Worsted Dress Goods.

Fine Cotton Goods.

Cotton Yarns.

Worsted Yarns.

Worsted Tops.

Worsted Rovings.

Mercerized Yarns a Specialty.

Digitized by Google

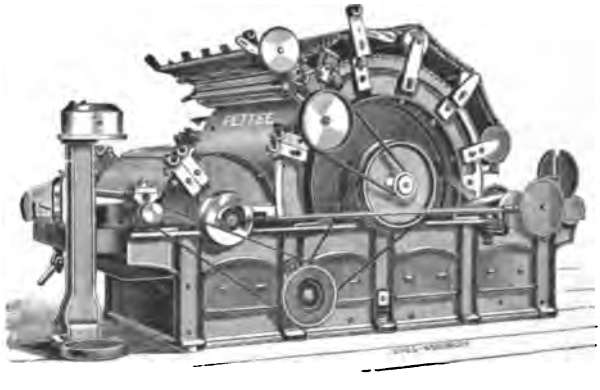
Saco AND Pettee Machine Shops.

Main Office, NEWTON UPPER FALLS, MASS.

COTTON MACHINERY

OF THE

LATEST IMPROVED PATTERN.



Revolving Flat Cards, Slubbing,
Railway Heads, Intermediate,
Drawing Frames, Roving,
Spoolers and Reels. Spinning Frames.

SHOPS: . . . { Biddeford, Maine. / Newton Upper Falls, Mass.

Southern Office, - - - CHARLOTTE, N. C.

A. H. WASHBURN, Agent.

☞ Send for estimates and prices.

81—82 T. F.

Digitized by Google

STODDARD

IMPORTERS OF
COTTON, SILK, WORSTED, WOOLEN AND FIBRE
MACHINERY, MILL SUPPLIES, EGYPTIAN
COTTON and BURLAPS.

Sole American Representatives for

DOBSON & BARLOW, LTD.
New Hopper Bale Breakers, Pickers, Cards, Combers, Fly Frames, Mules, Gassers, etc. Improved Worsted Carding Engines.
PRINCE, SMITH & SON.
Gilling, Noble Combs, Drawing Roving, Spinning, Twisting and Reeling Machinery.

HASERICK

SOCIETE ALSACIENNE de CONSTRUCTIONS MECANIQUES de MULHOUSE,
Alsatian Cotton Combers, Slashers, for Fine Warps, French Worsted Machinery.
SAMUEL LAW & SONS, LTD.
Card Clothing of Every Description.
WM. WHITELEY & SONS, LTD.
Mules, Tentering Machines, Warpers, Mercerized Machinery, Etc.
E. HOYLE & SONS, LTD.
Dyeing and Finishing Machinery, Hydraulic Presses.
HARDING, RICHARDSON, RHODES & CO., LTD.
Gill and Combing Pins, Needles.
SAMUEL ROWBOTTOM.
Spindle Bands and Tapes.

RICHARDS

JOHN DIXON & SONS.
Mill Bobbins.
J. PARKINSON.
Loom Temples.
J. KAYE & SONS, LTD.
Patent Oil Cans.
J. WHITE & SONS, LTD.
Apron and Picker Leather.

Mill Supplies German Tempered Steel Wire Heddles, Persian Roller Skins, Worsted Doup Twine, Leathers, Etc.

& CO.

152-8 Congress St., Boston, 8 Currer St., Bradford, Eng.
Offices: Bourse Bldg., Philadelphia, Pa. Charlotte, N. C.

EGYPTIAN COTTON,
CARVER BROS. & CO., Ltd.
Alexandria, Egypt. Liverpool, Eng.

Digitized by Google

The Whitin Machine Works,

WHITINSVILLE, MASS.

BUILDERS OF

COTTON MACHINERY,

Cards,	**Combing Machines,**	**Twisters,**
Railway Heads,	**Drawing Frames,**	**Reels,**
Sliver Lap Machines,	**Spinning Frames,**	**Long Chain Quillers,**
Ribbon Lap Machines,	**Spoolers,**	**Looms.**

SOUTHERN AGENT:

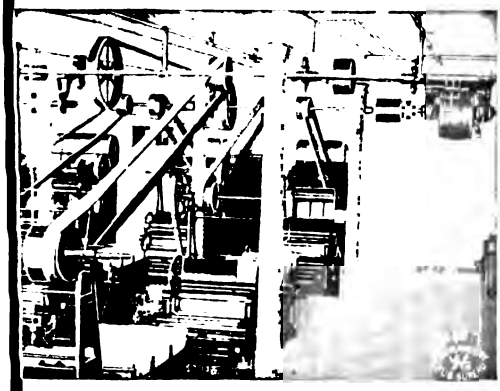
STUART W. CRAMER, - Court House Square, Charlotte, N. C.

AND CANDLER BUILDING, ATLANTA, GA.

Digitized by Google

General Electric Company

Electric Power for Textile Mills.



Picker Room in First Electrically Driven Textile Mill in the World, Columbia Mills.

Modern Curtis Steam Turbine Generators at Fulton Bag and Cotton Mills, Atlanta, Ga.

The history of the Electric Drive in Textile Mills is a record of successful General Electric induction motor application.

Twelve Years Ago—700 H. P.

General Electric Induction Motors were installed in the first electrically operated mill in the world. These motors are today "as good as the day they were started, and have never given the slightest trouble."

To-day—140,000 H. P.

In the United States alone, over 180 textile mills are operated by General Electric Induction Motors, having an aggregate capacity of 140,000 H. P.—two-thirds of the total electrical horse power installed in textile mills.

The Mill Power Department,

Embodying the ripened knowledge and varied experience of these 12 years of successful work will take up your project in detail. Special attention is given to the use of individual drive. In more than a thousand cases a motor has been directly connected to an individual textile machine. Careful study is given to each case to determine the relative merits of individual drive or group system.

Principal Office: Schenectady, N. Y.

Boston Office: 84 State Street.

OFFICES IN ALL LARGE CITIES.

1175

Digitized by Google

"KITSON PRODUCTS"

Blowing Systems,

For Conveying Bale Cotton
from Storehouse to Picker-room.

Self-Feeding Openers,
Lappers and
Cleaning Trunks.

Waste Working Machinery.

Raw Stock Cotton Dryers.

We own the patterns and can furnish REPAIR PARTS for PICKERS formerly built by

WHITEHEAD & ATHERTON
LOWELL, MASS.

ATHERTON MACHINE CO.
LOWELL, MASS.

A. T. ATHERTON MACHINE CO.
PAWTUCKET, R. I.

KITSON MACHINE SHOP,

LOWELL, MASS.

Digitized by Google

FOR a Fly Frame that will give you a large production at small amount of cost and horse power, go to the WOONSOCKET MACHINE & PRESS COMPANY, Woonsocket, R. I. They also manufacture Cloth Trimmers, Shafting, Hangers, Pulleys, Friction Clutches, &c.

Digitized by Google

THE REAL AUTOMATIC

NORTHROP LOOM

Built by

Draper Company,

In Rather Large Quantities at

HOPEDALE, MASS.

Digitized by Google

Mill Heating by Hot Water.

TWENTY-FIVE PER CENT. SAVING OVER STEAM.

THE JENNISON COMPANY,

Engineers and Contractors,

FITCHBURG, - MASS.

82—83

Manufacturers should look up the advantages of the

METALLIC DRAWING ROLL

Over the leather system before placing orders for new machinery, or if contemplating an increase in production, have them applied to their old machinery.

25 Per Cent. More Production GUARANTEED.

SAVES

Roll Covering,
Varnishing,
Floor Space,
Power,
Waste and
Wear.

ONE-THIRD LESS WEIGHT REQUIRED.

Write for Points Claimed, also Prices and Particulars, to

The Metallic Drawing Roll Co.,

INDIAN ORCHARD, MASS.

82—83

Digitized by Google

T. C. ENTWISTLE COMPANY,

FRANK B. KENNEY, Manager, **LOWELL, MASS.**

Patent Warping, Balling, and Beaming MACHINES.

PATENT EXPANSION COMBS FOR WARPERS, BEAMERS AND SLASHERS,
TRAVERSE WHEEL AND ROLL GRINDERS.

STUART W. CRAMER, Southern Agt., Charlotte, N. C.

81—82

COTTON MILL MEN!

Use our Card Clothing to get results you are looking for.

Also Twin Wire T. S. Soldered Heddles.

HOWARD BROS. MFG. CO.,
(Outside Card Clothing Combine.)

44 and 46 Vine Street,
Worcester, Mass.

81—82

WHEN IN NEED OF

Engravings or Electrotypes,

CALL UP

The Suffolk Engraving Company,

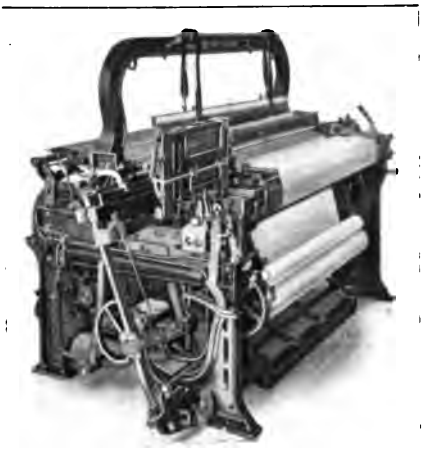
6857 Main,

234 Congress Street, - - BOSTON, MASS.

81—82

Digitized by Google

"IDEAL" Automatic Loom



AND

LOOMS OF ALL KINDS

For the Manufacture of Cotton and Silk Fabrics;

Dobbies, Warp Stop Motions, Fancy Weaving Motions, Temples, Etc.

THE STAFFORD COMPANY,

READVILLE, MASS.

82—83

LOWELL TEXTILE SCHOOL.

Scientific and Practical Training in all Processes of Textile Manufacture, including all Commercial Fibres.

Complete Courses of Instruction in
Cotton Manufacturing,
Wool Manufacturing,
Textile Designing,
Chemistry and Dyeing,
Textile Engineering.

Courses include Instruction in Mechanism, Mechanical Drawing, Mathematics, Physics, Chemistry, Steam and Electrical Engineering, Language and Decorative Art.

Graduates of high schools, academies or schools of equivalent standing admitted upon certificate. Graduates of colleges and scientific schools admitted to advanced standing.

Catalogue: CHARLES H. EAMES, S. B., Principal, LOWELL, MASS.

82—83

Digitized by Google

HOLYOKE MACHINE CO.,

Worcester, Mass.

Hercuels Turbine Water Wheels.

POWER TRANSMISSION
.....MACHINERY.....

TURNED STEEL SHAFTING,
COUPLINGS, HANGERS, PULLEYS,
FRICTION PULLEYS AND COUPLINGS,
ROPE SHEAVES,
BELT TIGHTENERS,
GEARS, FIRE PUMPS, ETC., ETC.

81—82

General Fire Extinguisher Co.

Manufacturers, Jobbers, and dealers in PIPE, FITTINGS, VALVES, HYDRANTS, and all kinds of Steam, Gas and Water Supplies and Specialties.

Factories and Warehouses equipped with the GRINNELL AUTOMATIC SPRINKLER, on the Wet Pipe or Dry Pipe System, as may be desired.

The Grinnell Dry Pipe System affords thorough protection all the year around for buildings in which the water in a Wet Pipe System would freeze.

DEPARTMENT AGENCIES:

PROVIDENCE. Union Trust Building.
BOSTON, Post Office Square Building.
NEW YORK, Trinity Building.
BUFFALO, 67 Dun Building.
PHILADELPHIA, Mutual Life Building.
PITTSBURG, Machesney Building.
CLEVELAND, Society for Savings Building.
CINCINNATI, Union Trust Building.
ST. LOUIS, Lincoln Trust Building.
ATLANTA, GA., 276 Marietta St.
CHARLOTTE, N. C., 116-118 So. College St.
CHICAGO, Royal Insurance Building.
MONTREAL, 231 Craig Street, West.

Information and proposals furnished at the Several Department Agencies, and at the

Executive Offices, PROVIDENCE, R. I.

81—82

Digitized by Google

SALEM ELEVATOR WORKS,

CHARLES F. CURWEN, Proprietor.

SALEM, - MASS.

ELECTRIC AND BELT POWER

ELEVATORS.

Over 1000 in Use in Textile Plants Alone.

AUTOMATIC HATCH DOORS,
SELF-CLOSING LOCK SAFETY GATES.

Send for Illustrated Catalogue. ELEVATOR ROPES.

81—82

Dinsmore Manufacturing Co.

(ESTABLISHED 1874.)

SALEM, - - MASS.

Mill Sewing Machines

AND SUPPLIES.

13 Different Styles of Machines.

For Cotton and Woolen Mills, Bleacheries, Print Works, Silk Mills, Etc.

Over 4,000 in Use.

CHAS. F. CURWEN, Treasurer.

Send for Illustrated Catalogue.

81—82

Digitized by Google

HENRY ASHWORTH. C. M. CLARK. R. C. ASHWORTH.

ASHWORTH BROS.

MANUFACTURERS OF

CARD CLOTHING

SPECIALTIES:

Clothing for Revolving Flat Cards.
Napper and Brusher Clothing.
Top Flats Clothed with Improved Steel Clamps.

89 GLOBE MILLS AVENUE, - - FALL RIVER, MASS.

SOUTHERN AGENCY:

W. H. BIGELOW, No. 12 West Fourth St., Charlotte, N. C.

81—82 T. F.

Northeastern Department

C. E. ROBERTS, Manager.

101 MILK STREET, BOSTON, MASS.

81—82

EGYPTIAN, COTTON PERUVIAN.

THE S. BLAISDELL, Jr., COMPANY.

American Long Staple a Specialty. Shipments Direct to Mill from Egypt, Peru and all American Southern Points.

COTTON WASTE Purchased on Yearly Contracts From Mills.

CHICOPEE, - - MASS.

81—82

Digitized by Google

A FAN SYSTEM

GIVES BEST AND MOST POSITIVE RESULTS.

"DAVIDSON" FANS for Ventilating and Drying.

"STEEL PLATE" Fans and Coils for Mechanical Draft, Heating and Drying.

MASSACHUSETTS FAN COMPANY,

Manufacturers and Engineers,

WATERTOWN, - - MASS.

81—82

New Bedford Textile School.

Day and Evening Instruction

IN PICKING, CARDING, COMBING, SPINNING, WARP PREPARATION, WEAVING, DESIGNING, KNITTING, CHEMISTRY, AND DYEING.

CATALOGUE ON APPLICATION.

ADDRESS.

H. W. NICHOLS, Supt.,

New Bedford Textile School,

New Bedford, Mass.

82—83 T. F.

Digitized by Google

TELEPHONE, MAIN No. 2206.

82—83

LOOMS

FOR ALL PLAIN AND FANCY COTTONS.

The quality of the material used in construction, and the skill and experience of our builders are some of the principal factors in the long-continued success of C. & K. looms.

DOBBIES
JACQUARDS
SUPPLIES
REPAIRS

CROMPTON & KNOWLES LOOM WORKS

WORCESTER

PROVIDENCE PHILADELPHIA.

82—83

C. R. MAKEPEACE & CO.

Mill Architects and Engineers.

PLANS AND SPECIFICATIONS Furnished for the Construction and Equipment of Cotton, Woolen and Worsted Mills. Bleaching and Dye Works. Old Mills Reorganized and Extended.

BUTLER EXCHANGE,

PROVIDENCE, - - R. I.

82—83 T. F.

Digitized by Google

EVAN ARTHUR LEIGH,

Successor to E. A. LEIGH & CO.

232 Summer Street, - BOSTON, MASS., U. S. A.

——IMPORTER OF——

Textile Machinery, Etc.

Sole Agent for the United States and Canada for

PLATT BROS. & CO. (Ltd.) of OLDHAM, ENGLAND,

By far the largest Makers in the World of

COTTON, WOOLEN AND WORSTED MACHINERY.

By the use of Platt's Cotton Machinery for either fine or coarse work, a larger production of better quality can be obtained at less cost.

Sole Makers of Brown's Patent Carding Engines for Wool—gives woolen yarn a worsted appearance.

Special Machinery for making English and French Worsted Yarns.

Special Machinery for making Cotton Waste into Yarns.

Platt's Woolen and Worsted Cards — special designs.

Platt's Mules for Cotton, Woolen and Worsted.

Machinery for Gassing and preparing Cotton, Worsted and Silk Yarns.

Joseph Sykes Brothers' Card Clothing for Cotton. **Jas. Critchley & Sons'** Clothing for Woolen and Worsted. **Dronsfield's** Grinding Machinery and Emery Filleting

George Hodgson's Looms for Worsted, etc.

Mather & Platt's Dyeing and Finishing Machinery.

Archbutt-Deeley System for Purifying and Softening Water.

Textile Machinery Association's Machinery for Flax, Hemp, Jute, etc.

Patent Automatic Feeding Machine Co.'s Feeders for all classes of fibres.

Haigh's Double Loop Bands and Driving Tapes.

82—83

OVERSEERS AND SUPERINTENDENTS,

Mark your Yarn with **Lowell Mill Crayons**

and you will not be troubled with cloth damaged by using poor crayons.

CAN WE SERVE YOU?

LOWELL CRAYON CO.,

Original Manufacturers,

Lowell, Mass.

Write for Sample Card showing Colors and Prices.

82—83 LOOK FOR TRADE MARK ON EVERY 5 LB. BOX.

One Results from Use of Other.

CLEAN SWEET MILL FLOORS.

SAVOGRAN.

INDIA ALKALI WORKS, 28-37 India Wharf, Boston.

Highest Awards, 1893–1887–1878. "32 years at it."

82—83

Digitized by Google

The
Bradford Durfee Textile School,
FALL RIVER, MASS.

Practical Instruction in all Branches of the Cotton Industry. Given on the Leading Makes of Machinery.

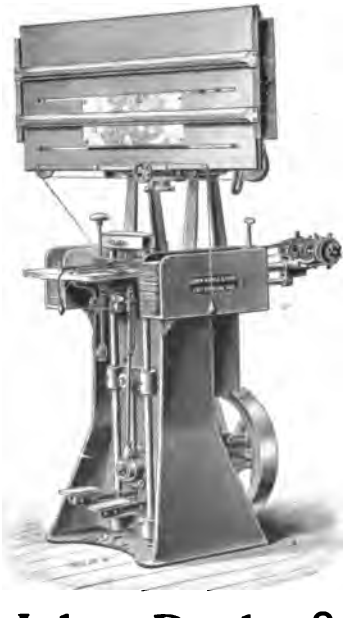
Day and Evening Classes in Picking, Carding, Spinning, Weaving, Designing, Chemistry and Dyeing.

The School is thoroughly equipped and organized, and the fact that it is located in a textile centre, which operates over three and one-half millions of spindles, in the manufacture of the greatest variety of cotton goods, will give students great advantages in securing a thorough textile education.

For Catalogues send to J. W. BAILEY, Principal.

82—83

Jacquard Card Machinery



Piano Machines—

Foot or Power Drive—for Cutting Original Pattern Set.

Automatic Lacers—

Power or Hand Feed—for Lacing the Individual Cards in Packs.

Automatic Repeaters—

Power or Hand Drive—for Duplicating Sets.

Unequalled for the Economical Preparation of the Jacquard Card for the Loom.

We invite your correspondence.

John Royle & Sons, Paterson, N. J.

82—83

Digitized by Google

THE J. R. MONTGOMERY CO.

WINDSOR LOCKS, CONN.

MERCERIZED COTTON YARNS

Showing Highest Possible Silk Lustre.

High Grade Cotton Warps AND Novelty Yarns.

Printers of Cotton, Wool, and Worsted Yarns.

82—83 T. F.

Sole Makers OF Jacobs' Pat. Roller Cushion Lug Strap

Jacobs' Pat. Verybest Lug Strap

Eclipse Lug Strap,
Knock 'Em Out Lug Strap,
Canvas Back Lug Strap,
Star Lug Strap,

X. X. C. Y. Tail Pickers,
Jersey Oak Tail Picker,
Surpass W.X. Picker,
Daisy Picker,

Jacobs' Diamond Picker Loops.
Jacobs' Braided Cord Dobby Straps.

Free Samples to Anyone Anywhere on earth.

E. H. JACOBS MFG. CO.

DANIELSON, CONN.

Digitized by Google

PHILADELPHIA

TEXTILE SCHOOL.

[PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART.]

TWENTY-FOURTH YEAR.

Instruction Given in All Branches of the Manufacture of Cotton, Wool, Worsted and Silk.

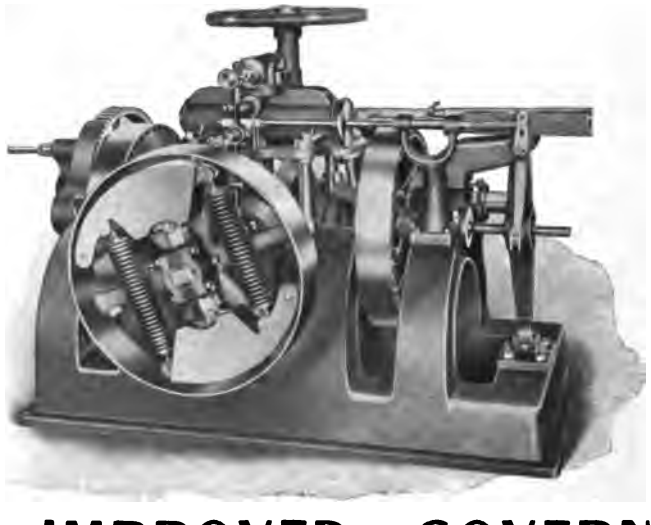
Complete Modern Equipment for Carding, Spinning, Dyeing, Weaving and Finishing.

1907 — Day classes open Sept. 30th. Evening classes open Oct. 7.

Endorsed by Leading Manufacturers and Educators. Send for Illustrated Year Book.

EDWARD W. FRANCE, Director, Broad and Pine Sts., Philadelphia.

81—82



THE IMPROVED GOVERNOR

FOR

WATER-WHEELS

INSTALLED ON SIXTY DAYS' TRIAL

And guaranteed to govern to the entire satisfaction of the purchaser.

HOLYOKE MACHINE CO., Worcester, Mass.

81—82

Digitized by Google

Lockwood, Greene & Company,

ENGINEERS and ARCHITECTS,

Entire Sixth Floor,
93 Federal Street, **BOSTON.**

Southern Office, Greenville, S. C.

Textile, Industrial and Power Plants.

82—83

PATENTED.

SPINNING AND TWISTER RINGS

OF EVERY VARIETY.

But Only One Quality—THE BEST.

Our Burnished Rings are the lightest running and most durable Rings ever produced.

Double Ribbed Rings are made exclusively by us.

Our U. S. Standard Traveler Cleaner is the acknowledged leader among Traveler Cleaners.

Economize in Travelers by using **Our Popular New Traveler Cup.**

Whitinsville Spinning Ring Co.

Whitinsville, Mass., U. S. A.

81-82

WOULD it not be advantageous to you in the conduct of your business to have direct and instant communication between your office and factory or storehouse, or between your counting-room and the various departments? This can be accomplished at slight expense by the

PRIVATE LINE DEPARTMENT
OF THE
NEW ENGLAND TELEPHONE & TELEGRAPH COMPANY.

Descriptive Catalogue sent on application to the Company, **101 Milk Street, Boston.**

Five minutes' telephoning will often save a day's traveling. The four corners of New England can be reached by telephone.

Digitized by Google

CHAS. T. MAIN,

(Formerly of DEAN & MAIN,)

Mill Engineer and Architect,

911 INTERNATIONAL TRUST BUILDING, 45 MILK ST.,

BOSTON, MASS.

Plans, Specifications and Supervisions for Construction and Reorganization of Textile Plants ; Valuations of and Reports on Manufacturing Properties.

81 82

PITTSBURGH

FILTER MFG. CO.

PRESSURE AND GRAVITY

Filters

WATER

Softening Plants

PITTSBURGH, PA.

81—82

THE ARABOL MANUFACTURING CO.,

100 WILLIAM ST., NEW YORK.

LEADING MANUFACTURERS AND IMPORTERS

OF MATERIALS OF EVERY DESCRIPTION, FOR USE IN

Sizing, Softening, Finishing and Weighting

of Warps, Fabrics, Twines, Thread, Etc.

Gloy G, Sizeoleum, Manchester Sizerine, Arabol X, Soluble Grease, Soluble Oils, Sizing Tallow, Wax, German Gum, Lancashire Size, Odorless Bone Size, Etc.

81--82

Digitized by Google

GRINNELL WILLIS & CO.

SELLING AGENTS,

44 & 46 Leonard St., New York.

BROWN and BLEACHED

SHEETINGS, SHIRTINGS,

INTERLININGS, DRILLS,

LONG CLOTHS, CAMBRICS,

LAWNS AND NAINSOOKS

FOR

HOME AND EXPORT MARKETS.

Special Finishes and Packing for the Export Trade.

Digitized by Google

F. P. SHELDON & CO.

MILL
STEAM
HYDRAULIC
ELECTRICAL
ENGINEERS.

5,000,000 Cotton Spindles.
16,000,000 Square Feet of Buildings.
240,000 H. P. Installations.

INDUSTRIAL TRUST BUILDING,

81—82 T F. PROVIDENCE, R. I.

Trade Mark.

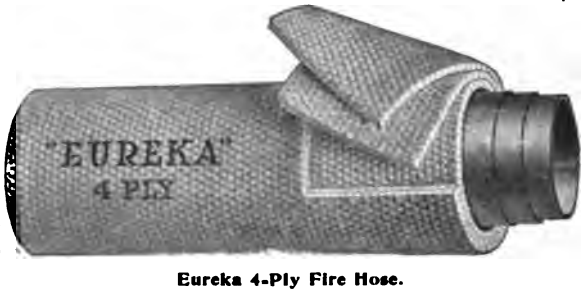
WE MAKE THE **BEST**

FIRE HOSE

FOR PROTECTING

Cotton Mills, Woolen Mills and Factories.

The Eureka "U. S. Underwriters" cotton rubber-lined, and "Eureka Underwriters' Best Linen" hose are made strictly in accordance with the requirements and specifications of the Associated Factory Mutual Fire Insurance Companies and National Fire Protection Association.



Eureka 4-Ply Fire Hose.

HOSE OF EVERY DESCRIPTION.

Sole Manufacturers of the Celebrated Brands:

EUREKA 4-Ply. **PARAGON** 3-Ply. **RED CROSS** 2-Ply.

SAMPLES AND FULL INFORMATION ON APPLICATION.

EUREKA FIRE HOSE COMPANY,

13 Barclay Street, - - NEW YORK.

81—82

THE CELL DRIER is simple, compact, efficient, and inexpensive to install, operate and maintain. Write to 15 State Street, Boston, for latest information.

VACUUM PROCESS COMPANY.

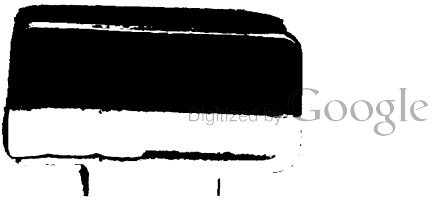
81—82

Digitized by Google

Digitized by Google

Digitized by Google

UNIV. OF MI.
AUG 9 1909



Digitized by Google